

The **Iron Age** A Chilton Publication

THE NATIONAL METALWORKING WEEKLY • SEPTEMBER 22, 1955

How will
'56 politics
affect your
business?
See page 63



NEW DEPARTURES OF TOMORROW



Today, the operation of many conveniences relies on New Departures. Low-cost New Departure ball bearings in the hinges of this refrigerator door let it swing open at a touch.

Set the table . . . then set the dial! Future meals could be as easy as that with this miracle meal-getter. And, maybe tomorrow it will be a reality.

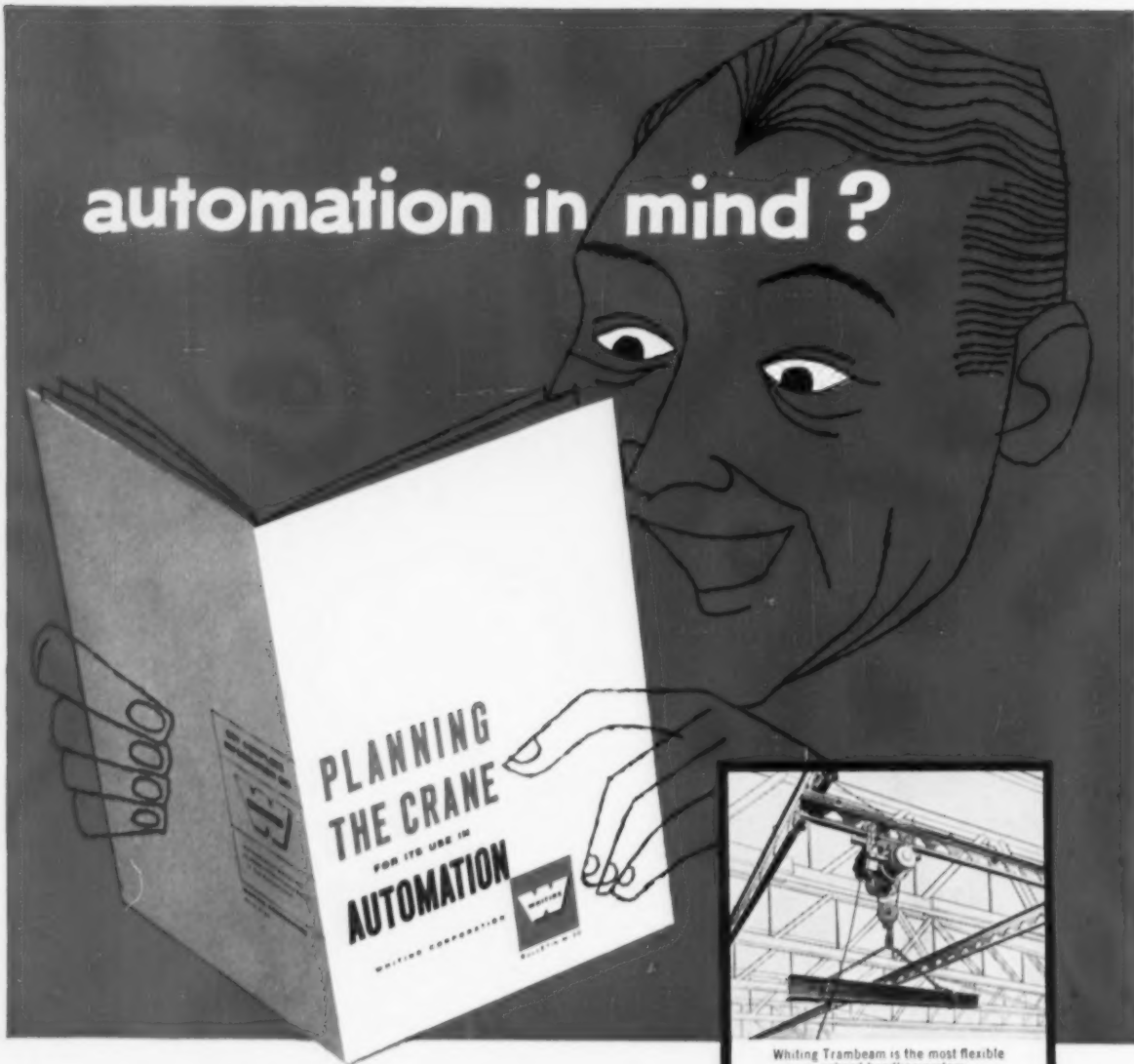
When it is, New Departure will play an important part, just as it does in so many of today's work-savers. For example, you'll find New Departure ball bearings in almost every major appliance . . . and for good reason. They keep moving parts functioning smoothly, while requiring virtually no maintenance. They support loads from any direction . . . keep parts always in perfect alignment.

If you're dreaming up tomorrow's time-saver, or improving your present product, call on New Departure for the most dependable ball bearings in the world.

NEW DEPARTURE

DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

automation in mind ?



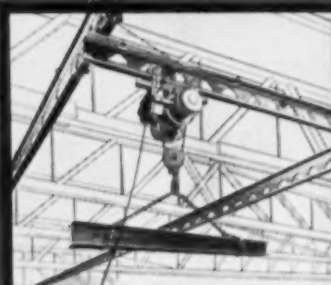
PLAN TO SPEED "FLOW" WITH OVERHEAD CRANE HANDLING!

Read the Whiting just-published 12-page booklet "Planning the Crane for Its Use in Automation!" It gives important information regarding the various types of overhead cranes...top running, underhung, monorail and gantry. It will help you determine the best system to handle your materials or products...quickly, smoothly, and at lower cost. Written by a specialist with many years of practical experience in solving handling problems, it will be of interest and value to you. Write today for your copy of Bulletin M-30.

WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Illinois

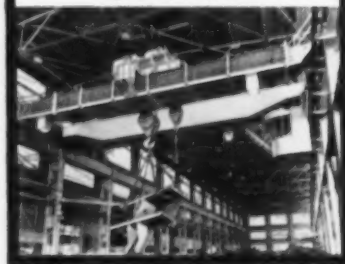
Manufacturer of Overhead Cranes; Trambeam
Handling Systems; Trackmobile; Foundry,
Transportation and Chemical Processing Equipment.



Whiting Trambeam is the most flexible overhead handling system.



Whiting Engineered Cranes handle big loads up to 500 tons.



Vanadium Alloy Steels and Their Uses

Though the beneficial effects of vanadium in alloy steels have been known for many years, the ore was at one time a comparative rarity. Vanadium is still rather expensive because of the care required in processing the ore; however, there are now ample supplies for present-day applications.

Vanadium is a highly valuable alloying agent. It is an extremely powerful deoxidizer, though seldom used primarily for that purpose. Vanadium also tends to form stable carbides in steel—carbides that do not go readily into solution when heated above the critical temperature for quenching. The grain-growth-inhibiting effect of vanadium promotes a fine-grained structure over a fairly broad quenching range, thus imparting strength and toughness to the heat-treated steel. Moreover, the carbides are not prone to agglomerate during the tempering operation.

Vanadium is used in constructional steels, not only to refine the grain, but to improve the mechanical-property balance. Generally speaking, the amount of vanadium in constructional steels ranges from approximately 0.03 to 0.25 pct, though larger quantities are required in tool steels and special analyses.

A list of products containing vanadium would include certain types of spring steels, plates, gears, high-temperature steels; forged axles, shafts, and turbine rotors; and other items requiring impact- and fatigue-resistance.

You are invited to consult with our staff whenever you need information about vanadium steels. Bethlehem metallurgists will gladly advise you regarding analyses, heat-treating, machining, and anticipated results. Please remember that the services of these technicians are yours for the asking, and that no obligation is implied.

And may we point out, too, that Bethlehem makes all AISI standard alloy steels, as well as special-analysis steels and the full range of carbon grades. Call upon us for your alloy steel requirements; now and always, we will endeavor to meet your needs promptly.

If you would like to have a reprint of this advertisement, or of the entire series from I through XII, please write to us, addressing your request to Publications Dept., Bethlehem Steel Company, Bethlehem, Pa.

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BETHLEHEM STEEL

Starred items are digested at the right

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Address mail to Chestnut and 56th Sts., Philadelphia 39, Pa.

NEWS DEVELOPMENTS

HOW 1956 POLITICS WILL AFFECT YOU — P. 63

Business will face more than usual problems in 1956 as presidential-election politicking gets into full swing. There will be plenty of investigations, usual anti-business speeches and slogans in the big vote-getting effort. Business men had better get used to working in a fish-bowl atmosphere. There are big issues to watch, too.

STEEL LABOR POT IS BEGINNING TO BOIL — P. 67

The labor story in steel will be a tough one in 1956. There are plenty of hot issues that may lead to trouble. Some authorities say there is a 50-50 chance of a strike. Chief problems will be supplementary unemployment benefits (SUB), wages, pensions, and social insurance. Government may have to step in if trouble looms.

FRENCH STEEL OUTPUT SHOWS SHARP RISE — P. 68

Steel production in France for the first half of 1955 was over 6 million tons. This was 26 pct more than the corresponding period in 1954. The French have a problem with fuel but demand is strong and production figures to continue at present pace for a full year total of 12.5 million tons.

HOW STEEL STRAIGHTENED A TITLE MIX-UP — P. 71

Names like Cracker, Flogger and Scruffman used to be job titles in the steel industry. With foremen applying job names since the early days of steel, something like 12,000 designations came into being. When wage grievances came to the fore in 1945, there was an urgent need for uniform titles. Initial efforts were unsuccessful but in 1953, the Standard Title and Code Handbook was adopted. Job titles were reduced to 888.

HOW DO DETROIT'S PLANS AFFECT YOU? — P. 77

All metalworking plants will feel effects of auto industry's success in next 12 months. Scope of building 7 million or more cars spreads beyond direct suppliers. Business confident that \$10 billion more in disposable income in 1956 will result in good sales and profits.

SENATE GROUP RAISES NEW MONOPOLY CRY—P. 85

A Senate subcommittee is set to stage new monopoly hearings. Investigators are out now quizzing auto parts makers, unions and car dealers. All signs point to a fresh going over for General Motors. The group will charge GM with industry domination and may ask for anti-trust action against the company.

ENGINEERING & PRODUCTION

HOW TO FIGURE INDUSTRIAL TRUCK COSTS — P. 103

Tracking down the cost of owning and operating industrial trucks is not easy, but will pay off in reducing overall operating expense. Realistic cost figures can tell you when to replace equipment, can locate high-cost handling areas and help point the way to more efficient industrial truck use.

PRE-FINISHED METALS OFFER ADVANTAGES — P. 107

Base metals pre-coated with surfaces that won't come off during fabrication are cutting costs on many familiar items. Pre-coating can be combined with mechanical pre-finishing such as embossing, perforating and brushing. Properties and uses of these ready-to-use sheet and strip materials are discussed and summarized to bring you up to date.

SOLDERABILITY: MANY FACTORS INVOLVED — P. 110

Solderability is a function of every factor which affects joint quality. In another sense, it's the ease with which solder will flow on metal. In either case, wetting of the base metal is required. Major difficulty in determining influence of such additional factors as temperature, time, capillarity, etc., lies in simulating production conditions in test programs.

ALL-BASIC OPENHEARTH GAINS GROUND — P. 114

After years of trial and error experiment the all-basic openhearth is starting to move. Two steel producers will begin work on all-basic furnaces early next year. Twenty pct gains in steelmaking capacity, 5 pct savings in fuel consumption are reported.

SALT BATHS CLEAN COMPLEX CASTINGS — P. 116

Castings for automatic automobile transmissions must be free of sand and scale if they are to give a reasonable service life. At the Marvel Schebler Div., Borg-Warner Corp., cleaning is done electro-chemically by immersing parts in a salt bath. Parts are cleaned in one to two minutes. Subsequent machining is easier.

MARKETS & PRICES

ALUMINUM FOIL COVERS BIGGER MARKET — P. 66

Public takes to brightly wrapped aluminum packages. Practical advantages of foil take second place to marketing considerations. Food products, however, need its protection. Aluminum producers plan big expansion of foil making facilities. Market makes big jump in 1955. More gains predicted.

LINEPIPE DEMAND IS PINCHING PLATES — P. 69

The linepipe market is still booming. And it looks as though demand will hold up for months to come. This is one of many reasons why plates are so tight. Refinery fire and floods are adding to confusion. Federal Power Commission authorized 4900 mi. of natural gas pipeline facilities in fiscal year ended last June. More coming.

WILL THE MARKET TAKE 7 MILLION CARS? — P. 80

Ford executive sees 7.4 million cars in 1956 model year. Chrysler and Ford 1956 cars have few radical styling changes. Chrysler introduces finger tip shift, long playing records for tired drivers. Automakers don't believe consumer is too far extended. Red auto trade is discounted.

WAS THE MACHINE TOOL SHOW A SUCCESS? — P. 91

Over 100,000 attended the Chicago Show. This tops the figure for the last machine tool exhibit by about 25,000. More important, viewers showed a solid buying interest. One builder predicts a doubled order backlog by the end of the year. Excitement over automation and general business prosperity were factors in the success of the event.

STEEL PRODUCTION WILL SMASH RECORDS — P. 143

The way things are going, 1955 is certain to set an all-time record for steel production. With demand continuing to boom, it's estimated that output will exceed the 111.6 million-ton record of 1953.

NEXT WEEK:

NEW METHOD SOLVES PLANT VENTILATION PROBLEM

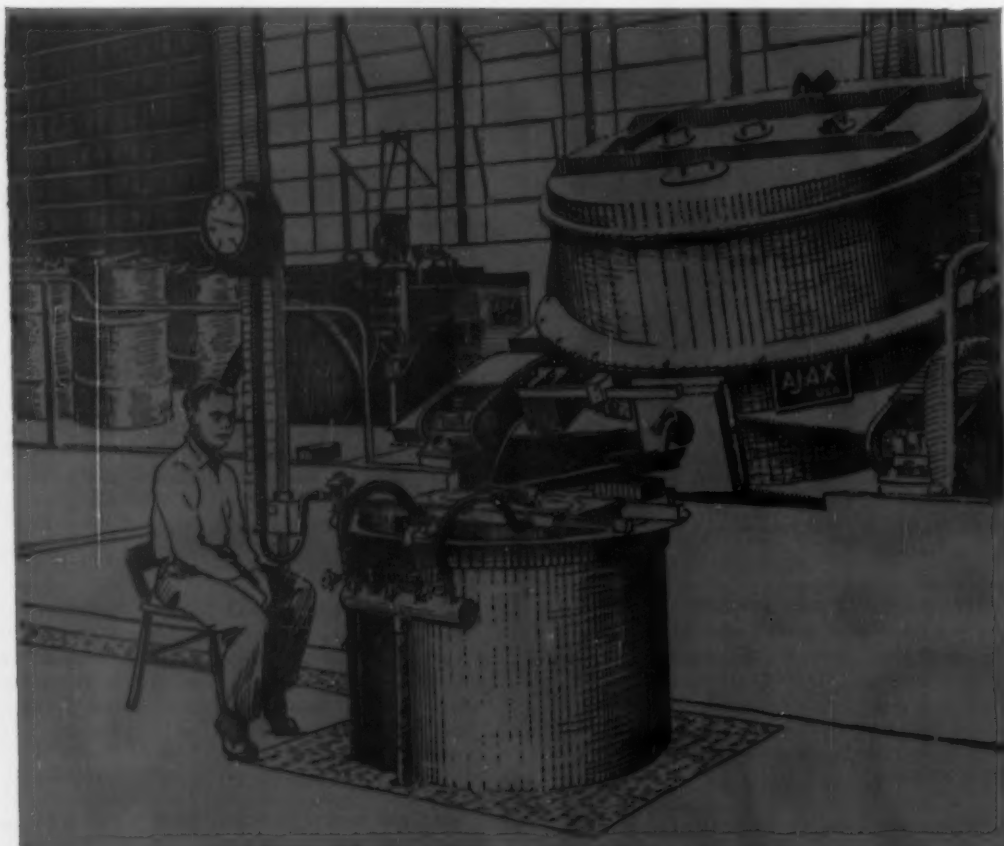
Adequate winter and summer ventilation is often a problem in wide, low-roofed, modern one-story plants. While perimeter areas are comfortable, powered roof air exhaust units may not meet interior ventilation needs. A new technique involving reversed roof ventilators and adjustable diffusers can often help.

WHAT'S YOUR STAKE IN THE 1956 FARM MARKET?

What's the farmer got on his mind in the way of new equipment purchases for 1956? Is the trend to automation on the farm continuing? What's new in the way of automatic equipment to make the farmer's lot easier? And with it all, how do you as a supplier fit into the picture? Next week's special report has the answers.

AJAX INDUCTION FURNACES

Will Reduce Metal Costs for You Too!



INSTALLATION AT VALLEY METAL PRODUCTS COMPANY - PLAINWELL, MICH.
(SUBSIDIARY OF MUELLER BRASS CO.)

Manufacturers of "Vampeco" architectural life long aluminum alloy extrusions, Valley Metal Products Co., use Ajax furnaces exclusively in their billet casting shop, because these furnaces enable them to produce aluminum alloy billets from selected scrap in the high quality required for their product.

The compact layout of this casting shop,

shown in the picture, includes two 166 kw Ajax melting furnaces and one Ajax 10,000 lbs. holding furnace which pours into a semi-continuous casting machine. Operation is continuous. **Production is 750,000 lbs. per month.** Metal losses are below 1%. The holding furnace requires no fluxing or chlorinating. Maintenance is low. Working conditions are comfortable and permit full utilization of all productive efforts.

VISIT OUR BOOTH 1619 AT METAL SHOW, OCT. 17-21

AJAX

TAMA-WYATT



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INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Refractory High Frequency Induction Furnaces
AJAX ELECTRIC CO., The Ajax Multiple Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

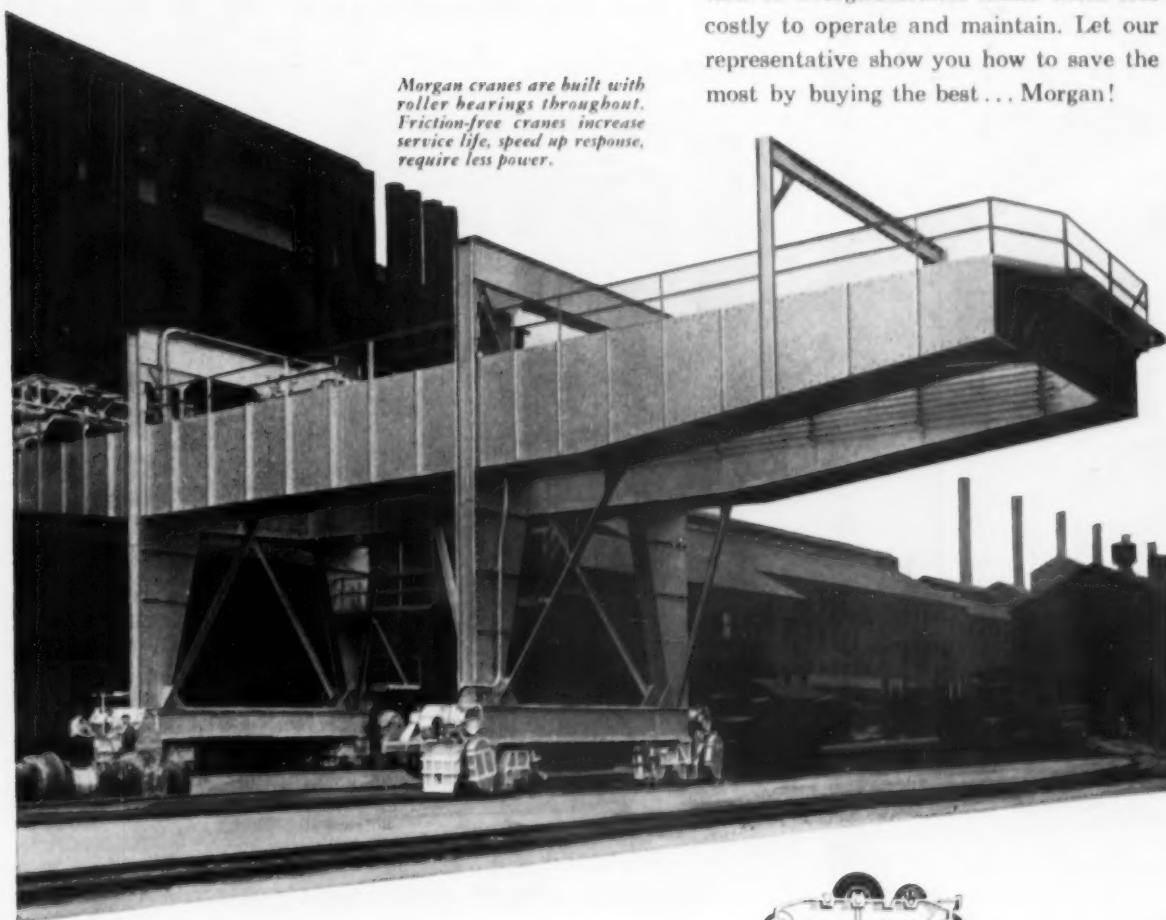
How Morgan keeps cranes "rolling"

Morgan cranes are built with roller bearings throughout. Friction-free cranes increase service life, speed up response, require less power.

● MORGAN "Anti-Friction Engineering" keeps cranes rolling by providing precisely correct bearings and mountings for each specific application . . . your assurance of longer trouble-free operation, lower maintenance costs.

"Anti-Friction Engineering" is another vital link in the chain of features that makes Morgan cranes best in the business.

Performance records prove that advanced design and heavy-duty construction of Morgan cranes make them less costly to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!



The Morgan Engineering Company manufactures overhead electric traveling cranes, gantry cranes, charging machines, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.

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ENGINEERING CO. *Alliance, Ohio*

it's

smart

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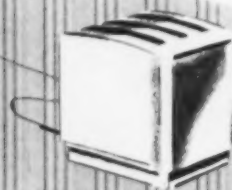
Style

BY CHANGING THE

STEEL...



... SWITCH TO



Leading designers in the automotive, appliance, business machine, hardware, and general metal fabricating fields are finding it smart to redesign with *Sharonart*. It may be painted or plated.

By simply changing from plain steel to one of the many handsome patterns of *Sharonart*, the product takes on a new beauty that greatly enhances its sales potential. No expensive retooling required. Just change the steel and an amazing style change takes place.

Let us send you a copy of the new *Sharonart* Booklet. It shows how many manufacturers are trimming their production costs by switching to these attractive surface-rolled patterns in steel.

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and the Engineering Index.



Editorial:

Why Defense Budget Confusion?

♦ NO ONE in his right mind could accuse President Eisenhower, Secretary Humphrey or Admiral Radford of scuttling our nation's defense in order to get a balanced budget or win an election.

This is the beginning of the political season. Much of what you see or hear will be geared to the 1956 presidential election. You will have to take some of these things with a grain of salt—no matter what party you belong to.

There has been a lot of talk about a balanced budget. But if you read the fine print you will not find that Secretary Humphrey guaranteed a balanced budget. He "hoped" that we would have one and he suggested that we should have one by next June 30. He will do everything he can to make good on the Administration promise of a balanced budget. But he won't endanger our defense program.

Early this year the defense budget was put at \$35.750 billion. It was suggested by the Defense Dept. and confirmed by Secretary Humphrey that because of normal slippages about \$1.750 billion would not be spent; actual estimate of spending was \$34 billion. Recent reports that \$1.750 billion are to be cut out of defense ignores news of months ago that this is not a saving—it is a carryover.

Reports that the goal is a \$33 billion defense budget suggest that \$1 billion is to be sliced off armed forces spending. It could be, but we have Admiral Radford's word that he doubts that much can be saved. Admiral Radford is no politician. His remarks that the defense of the nation will not suffer can be taken at face value.

The probability is that not one iota of defense spending necessary for the proper defense of the country will be cut. On the contrary, there is evidence that if there are any savings they will be in places which will not hit the Air Force as hard as some reports would indicate.

There is not much fat in the defense program. When it is set at around \$34 billion it is, as Mr. Wilson has said, about as low as we can get it and still "talk turkey."

Don't let political talk confuse you in the months ahead. And keep your oar in for a strong, vital defense program.

Tom Campbell

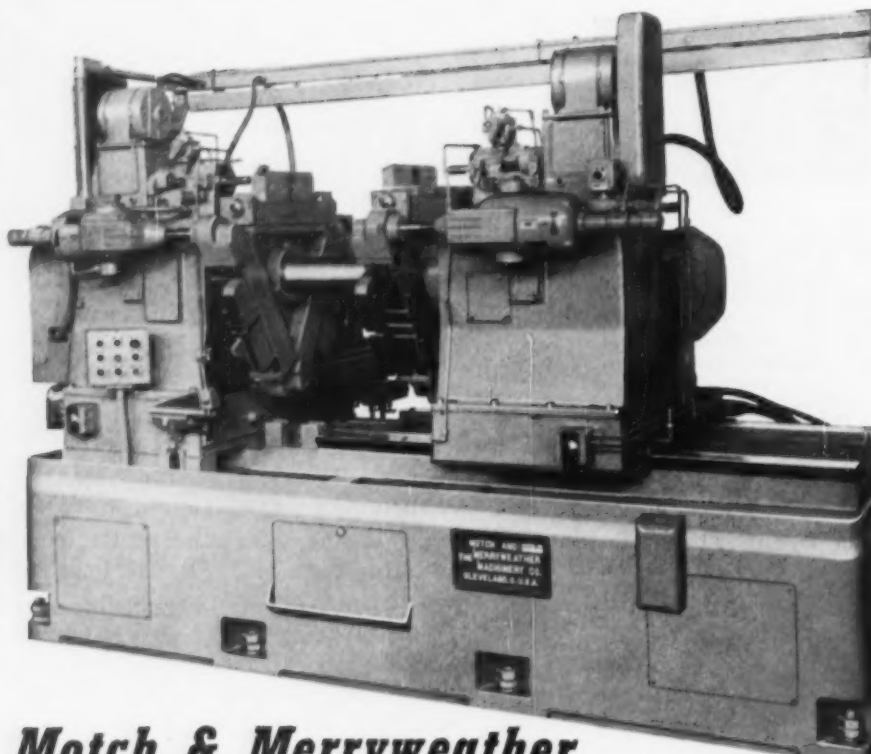
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Heavy Duty

Rigid

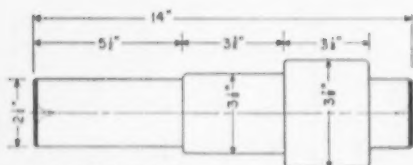
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Productive



The Motch & Merryweather **No. 3-MCT Milling and Centering Machine** FOR UNIVERSAL PRODUCTION

Adopt this Active Asset to Automation



Part: Pinion shaft.

Operation: Mill and center drill both ends.

Production: 220 pieces per hour.

Mass production, yet with extreme accuracy, — that is the central requirement for preparing parts which go to your automatic equipment. Begin automation *right* by preparing your parts *right* on the Motch & Merryweather 3-MCT Milling and Centering Machine. This universal heavy duty unit excels for high single-purpose production, while quick set-up makes short runs profitable. Automatic loading and unloading may be incorporated to handle extremely high production. The 3-MCT performs with a dispatch and precision hitherto unknown.

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MACHINERY MANUFACTURING DIVISION

CLEVELAND 13, OHIO

Builders also of Production Milling, Vertical Turning, Automatic and Special Machines

dear editor:

Unions Will Attack

Sir:

In re: "Unions Will Attack," page 73, September 1, 1955 issue: Why not reciprocate to wit:

1. The labor unions are the most corrupt organizations this country has had since Sam Parks and if they are allowed to continue in power—will result in the complete domination of our government by union racketeers.

2. We have big labor unions dominating the U. S. A., taking away everything from business management that is not nailed down and some of the things that are.

3. We have big labor organizations that are trying to nail our economic system to the cross.

4. We have big wealthy labor unions, so loaded with money that they are able to buy banks, finance businesses, etc. This surplus was exacted or stolen from the union members.

5. We have certain labor unions where violence predominates and where power is maintained by physical violence and attack. *L. A. Theisen, 70 Grant Avenue, Cliffside Park 6, N. J.*

Thomas Edison

Sir:

I am wondering whether you have in your library an index file that would show whether any articles or mention appeared between 1890 and 1900 regarding the Edison, N. J. activities of Thomas Edison in respect to beneficiation of iron ore.

It is my understanding that between these years, he set up a plant at Edison using the old Ogden mine, crushed the ore, magnetically extracted the iron, then briquetted it. I can recall some of the briquettes used in the late 90's by

letters from readers

Musconetcong Iron Works, Netcong, N. J., but not successfully as the binder disintegrated and it accumulated largely in the down comers as dust. It is my belief that this was before the days of sintering powdered ore as at present. *G. W. Armstrong, 353 Franklin Avenue, Ridgewood, N. J.*

Our files don't show any articles on this subject. Perhaps our readers can help. In the Materials Handling section of our 100th Anniversary issue mention was made of the first belt conveyor installed by Thomas Robins to handle ore at Edison's mine. A photo of Edison and Robins at the mine was supplied by Hewitt-Robins, Inc.—Ed.

Economic Development

Sir:

In your August 11th issue, page 53, you mention a privately sponsored committee for economic development. We are interested in receiving their policy statements and are wondering if you can give us the mailing address of this organization. *N. P. Whitney, Plant Manager, Industrial Hydraulics Div., Cessna Aircraft Co., Hutchinson, Kan.*

The address of the Committee for Economic Development is 444 Madison Avenue, New York.—Ed.

Chromium Plating

Sir:

We noted with interest an item on page 153 of your August 25th issue on a new chromium plating process. We are particularly interested in any new developments in coatings for titanium for increased resistance to galling and seizing. Can you tell us where we might obtain further details of this process? *M. L. Parrish, Application & Development Metallurgical Div., Westinghouse Electric Corp., P.O. Box 288, Kansas City.*

Further information may be obtained from P. J. Topelian, Research Director, Tiarco Research Laboratories, P. O. Box 766, Clark, N. J.—Ed.

Stuck for Ideas?



consider a ball



You're working on a new product. Or you're trying to improve an old one. You've tried one design after another, but none of them jell. Something's missing...

Is it a ball? A Universal ball?

Every day, designers and manufacturers are discovering new uses for balls precisioneer by Universal. Many of these new jobs are possible today only because of the infinite perfection that Universal puts into every ball it makes—whether it's pin-head small or golf-ball big. In chrome and stainless steel, this perfection means accuracy that is better than ten-millionths of an inch!

Yes, Universal Balls have what designers and manufacturers are looking for. They're full of ideas. May we tell you a few?

**Universal
Ball co.**

WILLOW GROVE
MONTGOMERY CO., PA.



Forged-in pockets provide tougher, stronger dies

This 35,000-pound die block, made of Finkl FX-T3 steel, has a forged-in pocket 12"x29"x34". In addition to the improved physical properties, the pocket forging increases the saving in machining time. There are many ways, such as this, that Finkl engineers can help you when planning die block or forging requirements.

When you next consider hot work tooling, die blocks or forgings, consider Finkl for the best. The quality of Finkl Hot Work Die Steels is the finest available and costs you less in the long run. Finkl die blocks will make a lasting impression with "impressions that last." Our engineers will gladly offer the advantage of their knowledge and our experience. There is no obligation.



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HOT WORK
STEEL
•
FORGINGS
•
ELECTRIC
FURNACE
STEELS**

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fatigue cracks

Nashua Couldn't Get Close

Seems the Hotel Morrison must be the favorite resting place in Chicago when magazine-newspaper people gather to report big events. Seven IRON AGE staffers rested there while covering the Machine Tool Show—and one of them found indisputable proof that a newspaper sports writer had previously tarried there while covering the great race between Nashua and Swaps the week before.

One of our men found the following account of the race lying crumpled in the wastebasket in his room, evidently typed by aforementioned sports writer and then abandoned, most likely in disgust, maybe.

Chicago, Aug. 31—California's golden-gaited Swaps was the winner taking all in his \$100,000 match race with the east's great Nashua at jam-packed Washington Park today, and how easily, breezily he took it. Swaps was a-winning out there in front all the way, even as he'd been in the Kentucky Derby. Nashua never could get close.

Quick to gain a two-length advantage in the red and black silks of Mormon Rex Ellsworth, masterfully maneuvered by Wee Willie Shoemaker, the bay whiz from the far west came galloping home with all of six lengths on William Woodward's Nashua.

How's that for a lead? Boy! Course it would have been a little better if Nashua hadn't beaten Swaps by six lengths. We only hope our unknown sports writer saw the race before filing this one. Otherwise, tragedy.

For a story that *was* filed on the scene, see our report in last week's issue on the Machine Tool Show—"Machine Tool Show Stirs Market," page 91, and more on page 119. In this issue see page 81, Machine Tool High Spots. This is real reporting of a great industrial exposition.

by William M. Coffey

Engineer-Writer Wanted

More word from the brains department is that they are looking for a young engineer who wants to write. The man for the job is one preferably with an engineering degree, who has had a good deal of production experience in the metalworking field. He is pretty good at writing reports in simple English, probably has done some article writing for company or national magazines. He'll locate in our new home office in Philadelphia, will spend an average of two or three days a week visiting plants and technical meetings digging up articles to help you, kind reader, do your job better. So if you know someone like this please tell him to get in touch with Managing Editor E. C. Beaudet. Better still, why not try for it yourself and maybe they'll even let you write Fatigue Cracks, too. A real promotion.

Puzzlers

Correct solutions to our two puzzlers of Aug. 4 (summer bonus puzzlers) keep coming in, so right here in this column, this very day, in this issue we continue with the long list of winners: Hugh Gordon, The Ethyl Corporation; A. L. Milford, Fairfield Mfg. Co; Vunovic (Charlsie), Letterman and Berry, Alias General Steel Castings Corporation; Holland Slutz, Wheeling Steel Corporation; H. I. Nelson, Blake Manufacturing Div; Marybelle Gill, International Steel Co; R. A. Badt, Los Angeles (sorry we spoiled your other puzzler, feeling a bit nasty that day); H. C. Keyser, American Steel Foundries; Austin H. Phelps, U. S. Engineers, Omaha; and Henry Hives, Aluminum Laboratories, Kingston, Ont., Canada.

The correct answers are still: 300 and 729 for the X and Y puzzler—and 11.28 for the ladder.

PRODUCTIVE MINUTE



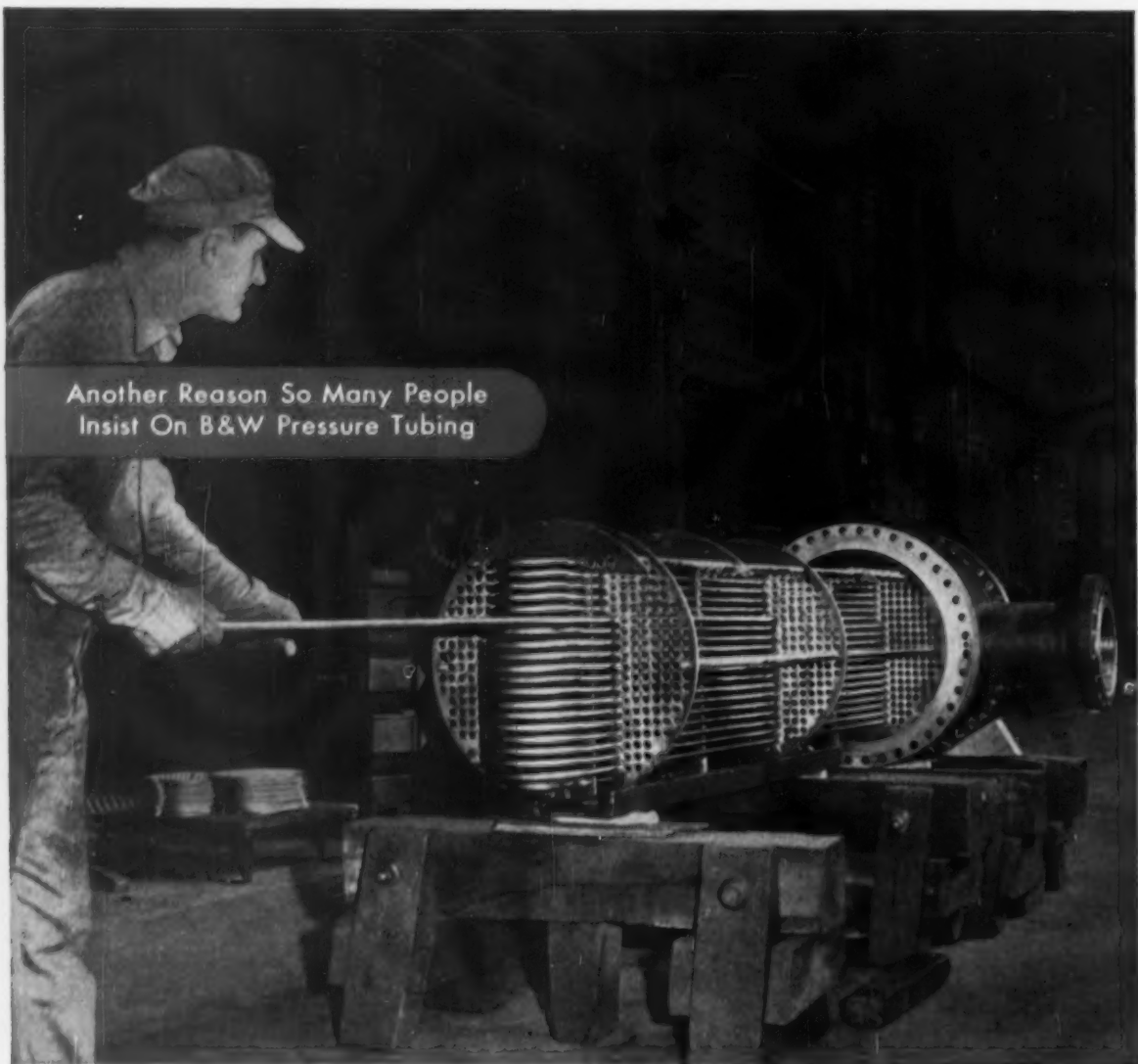
WHO makes it?
WHERE is it made?
HOW near are stocks?



MacRAE'S BLUE BOOK gives you the answers on all industrial products quickly, accurately, completely. MacRAE'S concentrates on the "Who" and "Where" facts needed by busy industrial purchasers. To make a minute more productive, reach for MacRAE'S. If you don't have a copy, inquire now on how to receive

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Another Reason So Many People
Insist On B&W Pressure Tubing

TALK ABOUT TOLERANCES!!

In oil fields, refineries, chemical plants—wherever heat transfer is important—you'll find Griscom-Russell heat exchangers on the job. The Griscom-Russell Company uses B&W Pressure Tubing to help build its reputation for efficient equipment. There's no jamming or tube distortion when threading B&W tubing through tube sheets and baffle plates. This preoccupation with close tolerances—a workaday rule at both B&W and Griscom-Russell—as-

sures closer control, greater efficiency in many heat transfer operations. In addition, B&W Pressure Tubing is famous for uniform ductility, tight joints, ease of rolling in, and low installation cost in any heat exchanger or condenser application.

For the complete story of how B&W Pressure Tubing can improve your operation, why not call in Mr. Tubes, your link to B&W. Or write today for *Bulletin TB-329-1A*.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing,
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Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5022(P)

dates to remember

OCTOBER

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Fall general meeting, October 11-15, Morrison Hotel, Chicago. Institute headquarters are at 36 W. 46th St., New York City.

FOUNDRY EQUIPMENT MANUFACTURERS ASSN.—Annual meeting, October 13-15, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 1008 Engineers Bldg., Cleveland.

CONVEYOR EQUIPMENT MANUFACTURERS ASSN.—Annual meeting, October 15-18, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at No. 1 Thomas Circle, Washington, D. C.

EXPOSITION

Philadelphia, October 17-21.

NATIONAL METAL CONGRESS AND EXPOSITION.

AMERICAN COKE & COAL CHEMICALS INSTITUTE—Annual meeting, October 17-18, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at 711 Fourteenth St. N. W., Washington, D. C.

AMERICAN GAS ASSN.—Annual convention, October 17-19, Los Angeles. Association headquarters are at 420 Lexington Ave., New York City.

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual fall meeting, Institute Metals Div., Oct. 17-19, Adelphia Hotel, Philadelphia. Institute headquarters are at 29 W. 39th St., New York City.

AMERICAN WELDING SOCIETY—National fall meeting, October 17-21, Philadelphia. Society headquarters are at 33 West 39th St., New York City.

RAIL STEEL BAR ASSOCIATION—74th meeting, October 24-25, Sherman Hotel, Chicago. Association headquarters are at 28 South Dearborn St., Chicago.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual fall meeting, October 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters are at 606 Terminal Tower, Cleveland.

PORCELAIN ENAMEL INSTITUTE—Annual meeting, October 26-28, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at 1346 Connecticut Ave. N. W., Washington, D. C.

METAL TREATING INSTITUTE—Annual meeting, October 29-31, Sheraton Hotel, Chicago. Institute headquarters are at 271 North Ave., New Rochelle, N. Y.

Believe it or not!



a Machine Tool Weldment

Bases like this, Fabricated by Acme

excel in Strength, Rigidity, and Precision

Finish . . . save Weight and Cut Costs.

No Design is too complicated

. . . not even Yours!

In Doubt? Ask for Bulletin B-3
"The Facts about Weldments and Castings"



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STEEL
STAINLESS STEEL
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A.S.M.E. U68-U69 Qualified Welders • A.P.I. - A.S.M.E. Approved Underwriters Label and Inspection Service • Navy Approved National Board Approved • Hartford Steam Boiler Inspection Service

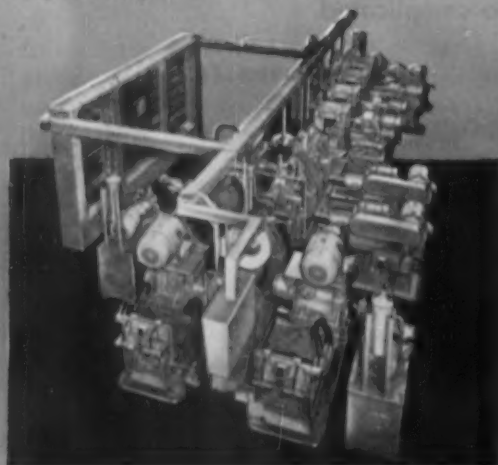
**SNYDER SEGMENTED
AUTOMATION** in 91 station,
182 operation, in-line transfer machine
features four segments which can
operate independently or as a unit to
assure continuous production of auto-
motive automatic transmission cases at
100 cases an hour at 80% efficiency

SNYDER

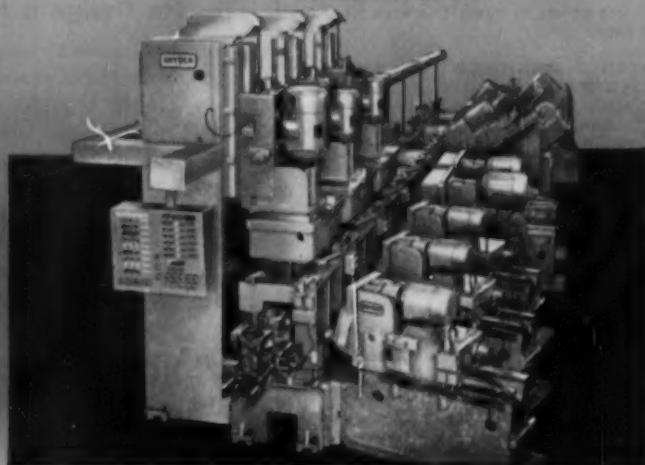
TOOL & ENGINEERING COMPANY
3400 E. LAFAYETTE, DETROIT 7, MICHIGAN

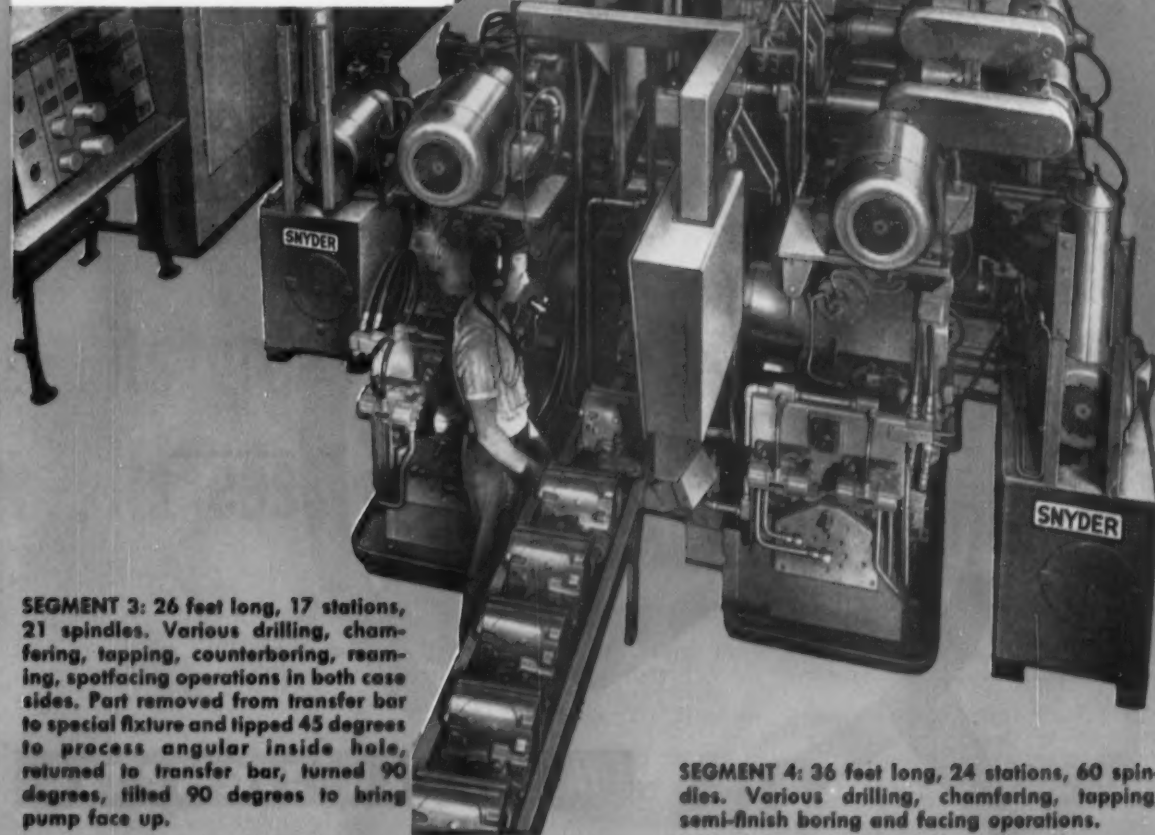
30 Years of Successful Cooperation with Leading American Industries

SEGMENT 1: 40 feet long, 19 stations, 10 spindles. Part manually loaded, both ends face milled, counterbored, three diameters rough and finish bored and faced, two pads side milled, pump pad face milled, clearance slot milled. Part tilted 90 degrees in processing.



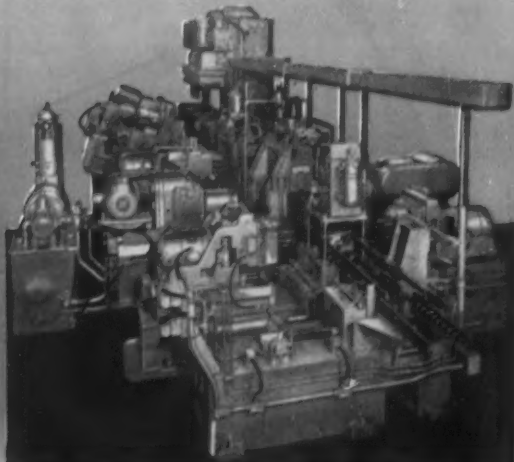
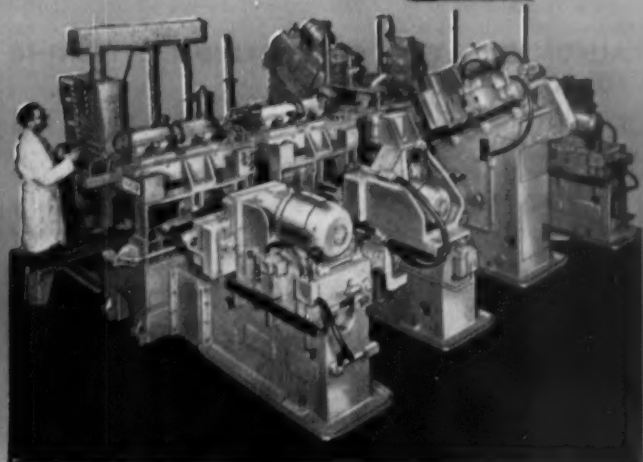
SEGMENT 2: 47 feet long, 31 stations, 91 spindles. In top face, end and at angular locations inside, 51 holes are drilled, countersunk, semi-finish and finish reamed, spot-faced, tapped. Part is tilted 90 degrees and rotated.

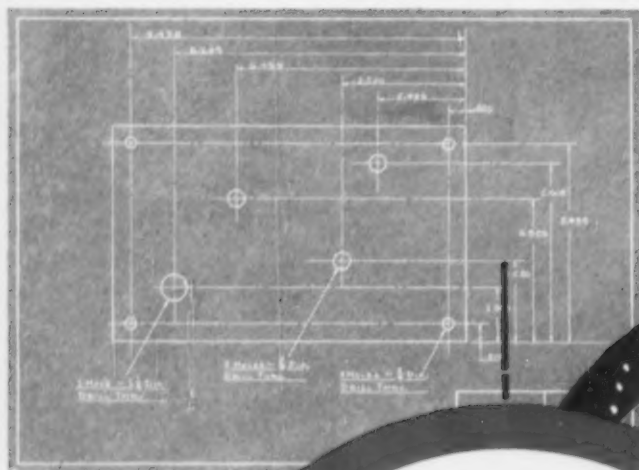




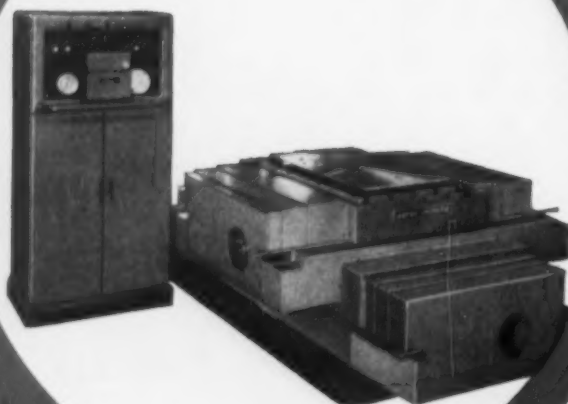
SEGMENT 3: 26 feet long, 17 stations, 21 spindles. Various drilling, chamfering, tapping, counterboring, reaming, spotfacing operations in both case sides. Part removed from transfer bar to special fixture and tipped 45 degrees to process angular inside hole, returned to transfer bar, turned 90 degrees, tilted 90 degrees to bring pump face up.

SEGMENT 4: 36 feet long, 24 stations, 60 spindles. Various drilling, chamfering, tapping, semi-finish boring and facing operations.





*this
tape
will save
you
\$ thousands
per year*



the **ARTER JIGMATIC**

AUTOMATIC, TAPE CONTROLLED POSITIONING FOR VERTICAL DRILLING

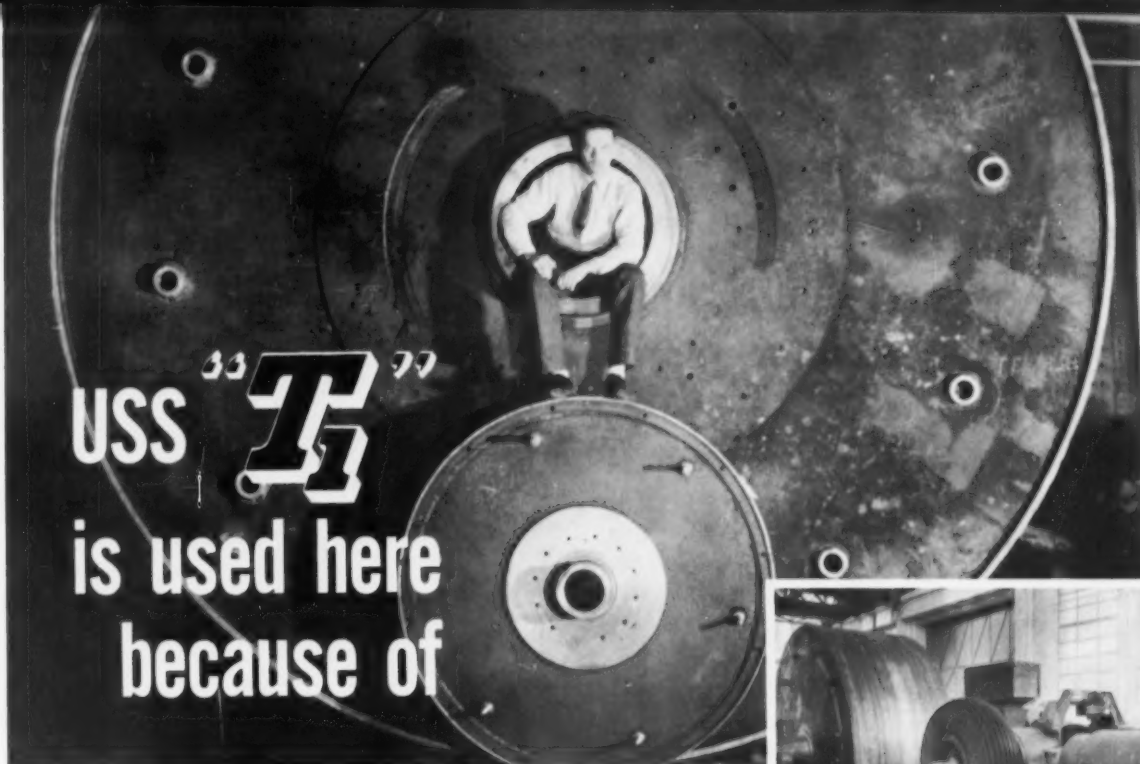
From blueprint to finished piece—it's all in the tape! Your engineering department punches the tape for desired hole locations. All your operator need do is push the "Position" button, then drill the holes. Costly set-up time is practically eliminated. There are no jigs or fixtures; no stops to set. Savings in set-up time alone amount to thousands of dollars per year.

Write for Bulletin I 55b

ARTER

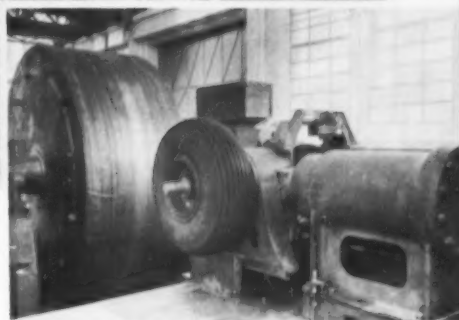
grinding machine company

**WORCESTER,
MASS.**



USS **"T-1"**
is used here
because of

... its great strength
... its ease of fabrication



'ROUND AND 'ROUND the flywheel goes, at a speed of 300 mph. Suddenly, an aircraft wheel assembly rams against it, with the impact of a loaded airplane. The tire squeals, the brake is applied, and in just 20 seconds the wheel stops. A real rugged test—both for the wheel assembly and for the steel in the flywheel. USS "T-1" Steel passed the test. In fact it is the best steel that could be used for this high speed application.

High speed tire, brake, and wheel testing machines like the one shown here, manufactured by Adamson United Company, Akron, Ohio, a subsidiary of United Engineering and Foundry Co., are used to prove out aircraft landing gear. The gigantic flywheels on these machines simulate the speed and inertia of an actual airplane during landing and take-off.

Until a short time ago, testing machines were built to rotate at peripheral speeds up to 250 mph. But when the aircraft industry spread its wings, faster testing machines were needed. The new machines had to rotate at speeds as high as 300

mph—and stay in one piece. They had to be extremely strong . . . light-weight . . . and easy to fabricate.

That's when USS "T-1" Steel entered the picture.

For flywheels rotating 300 mph, a steel of extremely high tensile strength was needed to withstand the tremendous stresses generated. A steel permitting the greatest strength for the thinnest section was needed. And, above all, the steel had to be capable of developing full 100% weld strength.

USS "T-1" Steel more than met all Adamson United's requirements.

Other steels could have provided the strength and met the weight re-

quirements. None but "T-1" provided these and good weldability too.

UNIQUE PROPERTIES—"T-1" Steel's unique combination of physical properties has solved many similar problems. "T-1" can be welded satisfactorily *without* pre- or post-heating—it can be welded either in the shop or field. Always, it provides great tensile strength (105,000 psi minimum with yield strength of 90,000 psi minimum), phenomenal toughness and excellent abrasion resistance. Write for full particulars. United States Steel, Room 4903, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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USS **"T-1"** CONSTRUCTIONAL ALLOY STEEL 

UNITED STATES STEEL

"It's the biggest alloy forging

says

Edward Schuerman,
U.S. Steel Hooker Leader



THAT PIECE OF STEEL held by the crane weighs 280,000 pounds. It is 30 inches thick, over 11 feet wide, and 22 feet long. An identical piece lies on the floor. Both will be parts for an extremely large press.

If you are a steel man, you may not be especially impressed by these figures, until you realize that the forgings are made from heat treated alloy steel . . . and the steel for each piece was poured as one heat from a single furnace.

Just *handling* forgings like these is a tough job, a job that falls into the lap of men like Edward Schuerman, Hooker Leader, a U.S. Steel employee for 29 years. He has to choose the correct hook or sling assembly, spot the crane, and supervise the lift. One mistake could delay a shipment by months, but Ed has never dropped a forging in his life.

This is the kind of man who works on every USS Quality Forging. You can put your faith in these men, in the steel that comes from our furnaces, and in the modern equipment that means prompt delivery and highest possible quality.

Write for our free 32-page booklet that describes USS Quality Forgings. Address inquiries or booklet requests to United States Steel, Room 4903, 525 William Penn Place, Pittsburgh 30, Pa.

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.



UNITED STATES STEEL

I ever saw!"



USS
Quality
FORGINGS

heavy machinery parts—carbon, alloy, stainless

forged steel rolls and back-up roll sleeves

electrical and water wheel shafts

hammer bases and columns

The complete pick-up tank is supplied with sample compartment, pump and hose. Stainless Steel is used for both interior and exterior surfaces. Stainless & Steel Products Company, St. Paul, Minn., is the manufacturer.



This tank truck had to be made from Stainless Steel



Tank shells are rolled on a 10' roll. Notice adhesive cloth tape used to protect inside surface of tank until job is complete.

The dairy and dairy equipment industries have been awfully busy these past few years, working out ways to reduce costs and maintain the flavor and quality of milk.

One major step has been *bulk milk* pickup. Instead of storing his milk in cans, today's modern farmer uses a Stainless Steel storage tank. Then, every-other-day, the dairy sends a tank truck to pick up the milk. The tank on the truck has to be made from Stainless Steel, because no other metal has such a unique combination of strength, corrosion resistance and cleanability.

The manufacturer of this tank truck uses Types 302 and 304 Stainless Steel—14-gauge shells for tanks 2000 gallons and under, 12-gauge for tanks 2000 to 5000 gallons. Both

gauges are sheared, rolled and punched on equipment with a nominal capacity of $\frac{3}{8}$ " carbon steel. Holes are cut with a carbon-arc torch, and all fittings are attached with electric arc welding.

If you have been wondering whether you can handle Stainless Steel successfully in your own shop with your present equipment, just remember that fabrication of Stainless Steel isn't difficult — it's just different.

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USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS



UNITED STATES STEEL

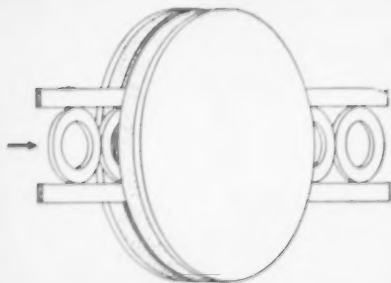
Two grade disc cuts grinding cost

35% more production / longer disc life

WORKPIECE
Cast Iron Rings

FORMER PRODUCTION
Smooth faced discs had to be replaced after grinding 21,500 rings.

PRODUCTION WITH GARDNER 2 GRADE DISCS
raised to 29,000 rings.



GARDNER WIRE-LOK® Abrasive Discs
30" x 2" x 3/2" with corrugated face

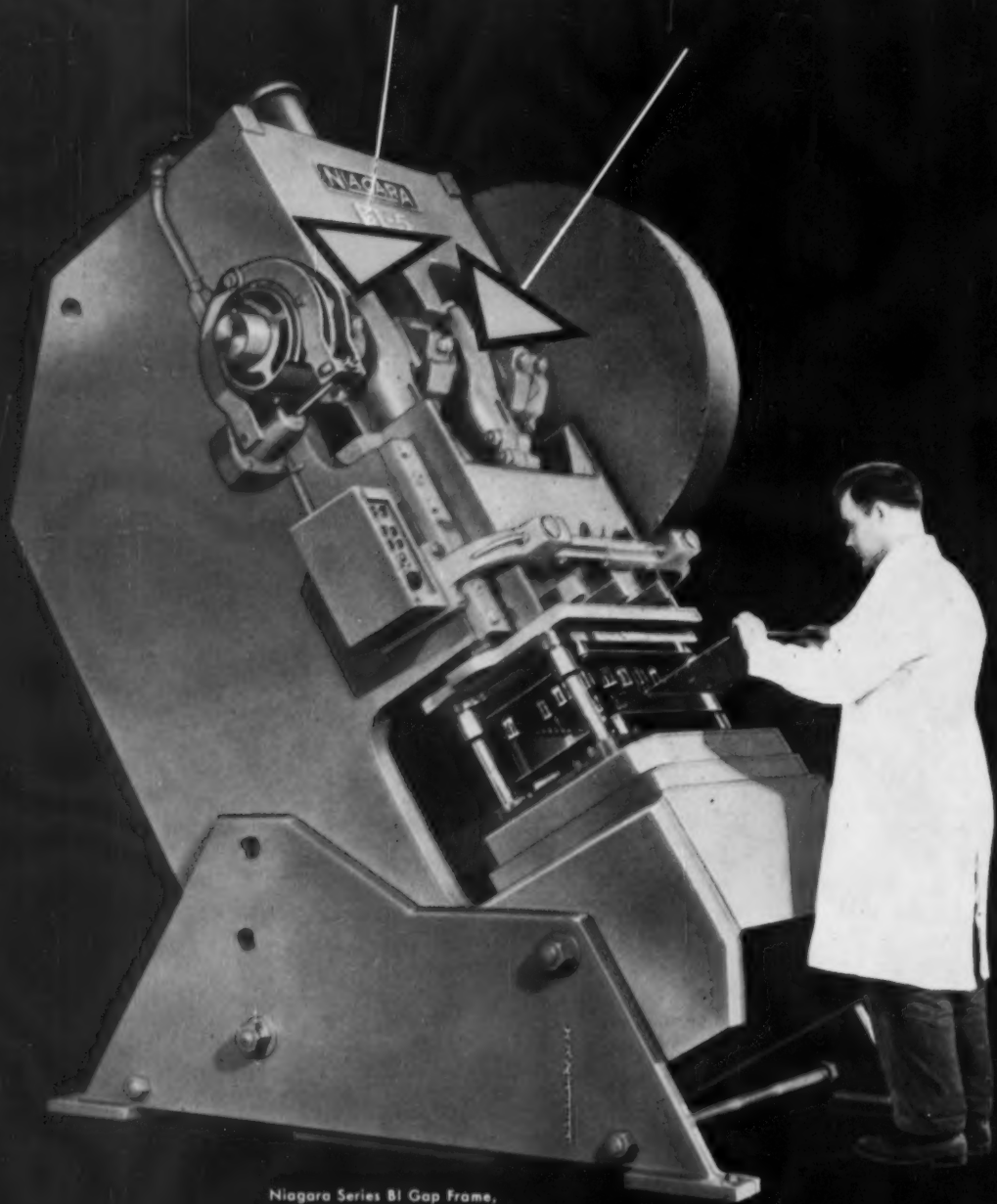
INNER GRADE—SOFT for maintaining
flat face on discs

OUTER GRADE—HARD for shear cut
and to resist "bell mouthing"

GARDNER
abrasive discs
BELOIT, WISCONSIN

NIAGARA 2 POINT

tomorrow's



Niagara Series BI Gap Frame,
Double Crank Inclined Press.

INCLINABLES

design for today's production needs*

From crown to base . . . *taking in every part and operating feature . . .* the Niagara Double Crank Inclined Press Series stands alone in advanced engineering. By record and by reputation, this is the press with the best future for cost-cutting, production-boosting, *long die area work.*

* LONGER LIFE FOR LONG DIES

Niagara's double crank design resists tilting of the slide under off-center loading, thereby reducing misalignment of dies. Rugged, welded steel plate, box type slide rigidly supports punches. Heavy duty, rigid, integrally built frame properly resists deflection, maintaining permanent alignment of bearings and slide.

FASTER WORK HANDLING

Die area is accessible from *all* sides. Work may be fed from either side or front-to-back with equal facility, and is quickly discharged by gravity through the unobstructed opening in the back when the press is inclined . . . *yes, even long work!*

GREATER VERSATILITY

A tremendous variety of blanking, perforating, forming and drawing operations can be performed, with emphasis on work requiring long die areas. All presses in the series are designed to readily accommodate pneumatic die cushions which Niagara furnishes complete with accessories and fittings.

HIGHER PRODUCTION RATE

Optionally equipped with automatic feeds and variable speed drives, Niagara 2-Point Inclinales are well suited to large quantity production and long, continuous runs.

MORE ECONOMICAL MAINTENANCE

Features that spell *stamina* and *ruggedness* . . . welded steel plate frames with box section crowns and deep beds forming rigid ties between uprights; welded steel plate, box type slides; precision "V"-flat gibs; bronze bushed main bearings; self-aligning ball-seat connections; Niagara electro-pneumatic and mechanical sleeve clutches . . . all combine to keep maintenance at a practical minimum.

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Standardized in capacities from 65 thru 222 tons, Niagara Series BI Double Crank Inclined Presses are your most logical answer to long die area work. For still longer requirements, Niagara builds a complete line of permanently inclined or upright Series B Presses.

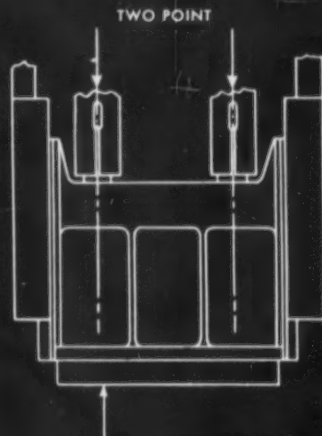
Obtain complete details on *all* the noteworthy Niagara features by requesting Bulletin 65. Consult with a Niagara engineer about *your* problems.



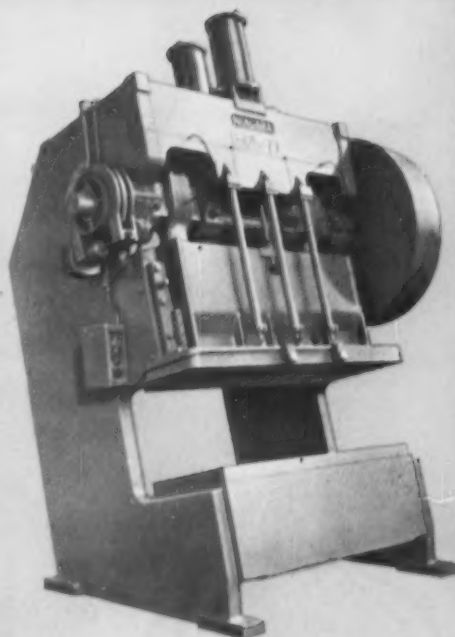
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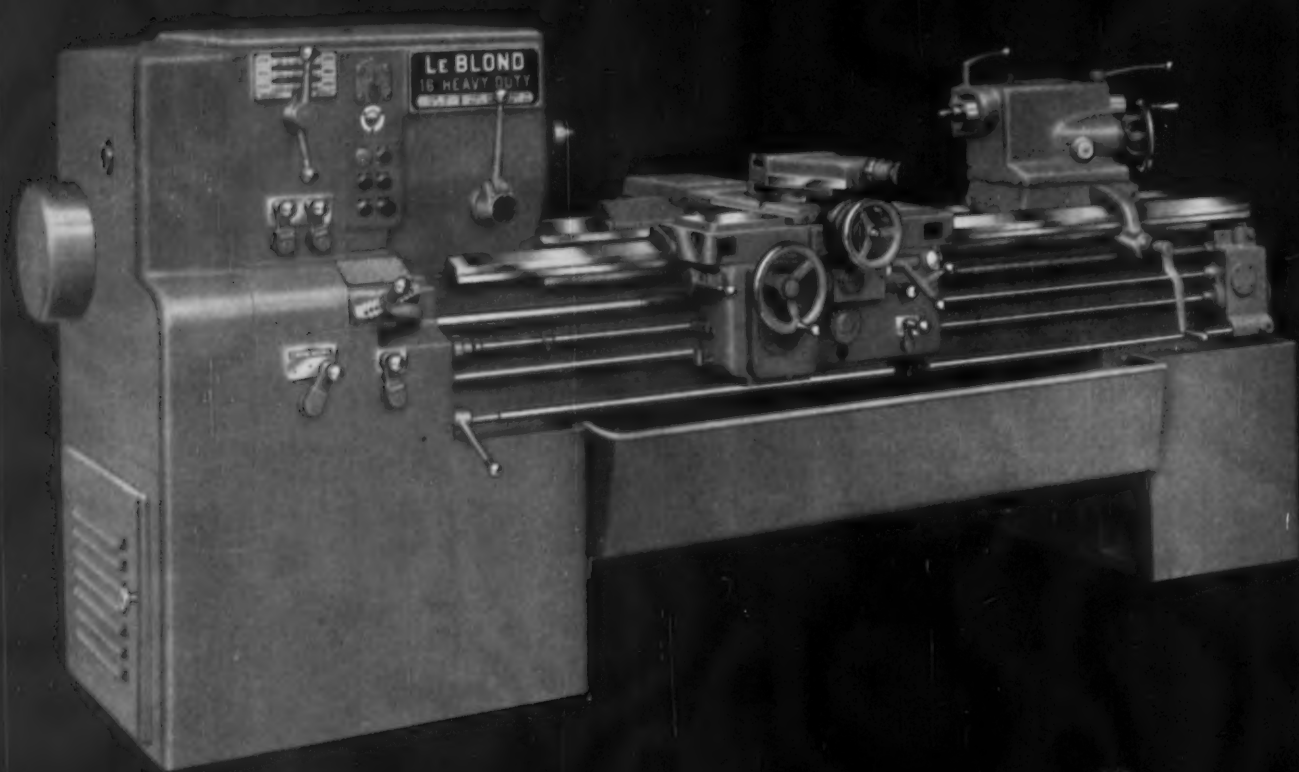
Off-center load resisted directly by two connections.



Niagara permanently inclined, gap frame, double crank press.

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

cut with confidence . . . **HERE'S THE**



New LeBlond 16" H.D. Heavy-Duty Lathe

NEW **LEBLOND**

16" HEAVY DUTY

stamina plus with precision

LeBlond heavy-duty engine lathes have always been known for their outstanding stamina—the inherent ability to stand up to the toughest turning jobs with precision, year after year. Our new 16" Heavy Duty is the most rugged, yet precise machine of its class that we've ever built!

The new headstock uses our proven combination gear-belt drive to give you a complete range of 27 spindle speeds from 16 to 2000 rpm chosen by direct-reading color plate. You get maximum power and smoothness from the 20-hp motor whether you're roughing or finishing—18 speeds are gear driven; 9 higher speeds are driven through a positive Gilmer-type belt that requires no adjustment. Free-running spur gear design assures minimum no-load friction horsepower . . . shafts and gears not needed for a given speed remain idle, do not consume power uselessly.

For a new degree of speed and convenience, a single lever controls the four-way power rapid traverse built into the apron. Both length and cross feed through a positive-jaw clutch are controlled by a single lever. Lubrication is entirely automatic. Bedways are hardened and ground steel inserts fitted to LeBlond's compensating veeway principle for better distribution of cutting forces. Quick-change box is totally enclosed. New tailstock uses the exclusive LeBlond thrust-lock design with a quick-set length dial.

For consistent and precise production, you can't do better than the new LeBlond 16" Heavy Duty. Call your nearby LeBlond Distributor or write for Bulletin HD-126C.

... cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY
CINCINNATI 8, OHIO

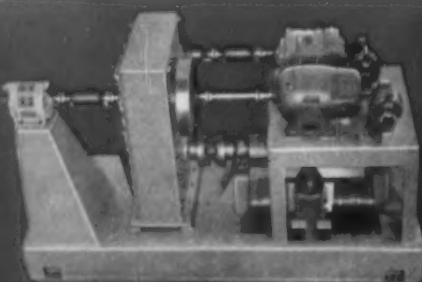


WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • FOR MORE THAN 68 YEARS

this is EC&M



For maximum "teamwork", the drafting and engineering departments are located side by side at EC&M.



The Test Tower, which dominates the EC&M roof-line, houses the above hoisting unit equipped with a d-c and an a-c motor used to test and develop hoist-control applications.



Assembly line production of Oil-Break Starters for hazardous locations. Each starter has its own oil disconnect switch.



New manufacturing plant and offices in Cleveland now provide EC&M with the most modern facilities for the production of motor control apparatus, automatic motor starters, and lifting magnets.

These facilities include new production machines, an enclosed test-tower for developing hoist-control circuits, and an improved flow of materials . . . all devoted to the efficient building of Magnetic Controllers, Brakes, Limit Stops, Resistors, Starters and Magnets. Production is backed by a closely knit engineering and manufacturing team.

Shown on the right are a few of the well-known EC&M products and the photographs directly below highlight some of the new manufacturing operations which will assure you of better service from all EC&M equipment.

EC&M has already earned a reputation for quality and engineered-to-order equipment. Now this reputation is magnified by a PLUS value by means of these enlarged facilities for developing, testing, engineering, manufacturing and shipping . . . all under one roof.

*Write for your copy of the new
EC&M Plant Booklet No. 6185*



THE ELECTRIC CONTROLLER & MFG. CO.

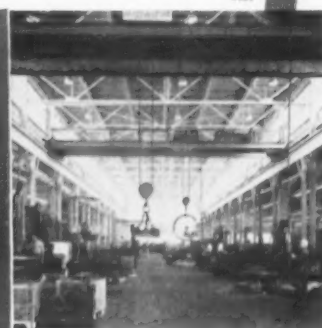
4498 Lee Road • Cleveland 28, Ohio



Magnetic Controller department where control circuit wiring and tinned-copper bus-bars are added to conform to engineered wiring diagrams.



65-inch diam. magnet-coil on motor-operated winding machine with strap copper being wound under electrically-controlled tension.



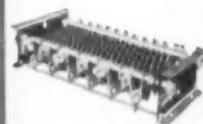
Completely modern, fully equipped magnet line for producing new magnets . . . renewing used magnets.



YOUNGSTOWN
SAFETY LIMIT
STOP
Bulletin 1032.



LONG-LIFE WB
BRAKES for A-c
and D-c Cranes.
Bulletin 1004.



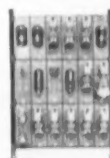
TAB-WELD
Plate Resistors
Bulletin 942.



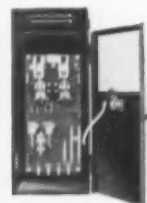
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THIS COMBINATION

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Scientific research in machining methods, metallurgy, tool geometry and inspection procedures.

Realistic Procurement — you have your choice of several sound financing methods, plus the advantages of new tax laws with more equitable write-offs.

From initial survey of your production requirements right through to delivery and installation of new equipment, every phase of J&L's

Replacement Program service is complete, competent and reliable.

The man who needs a machine tool . . . is already paying for it.

**GREATER
SAVINGS**

**FINEST
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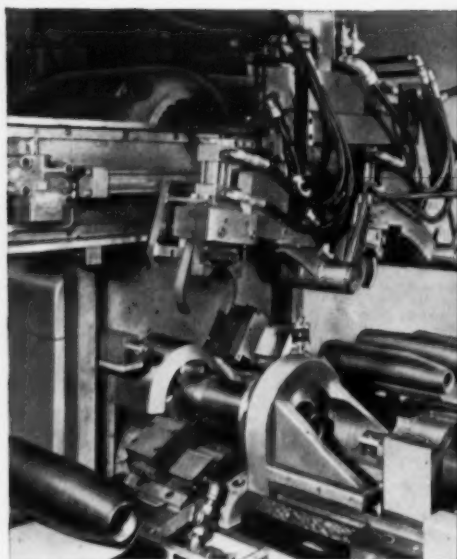
**EASIEST
PROCUREMENT**



JONES & LAMSON MACHINE COMPANY

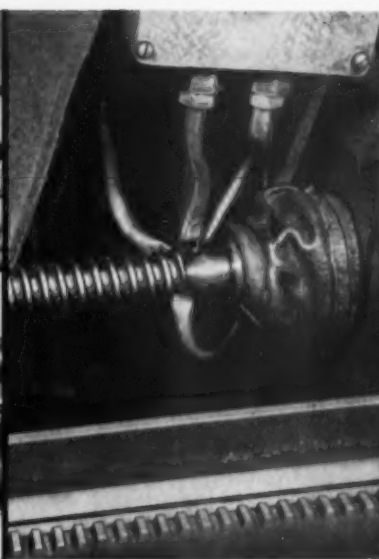
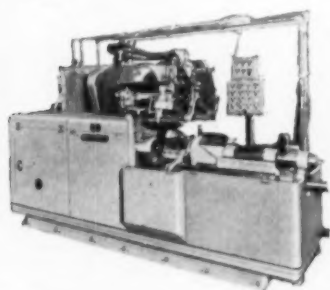
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AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES • AUTOMATIC THREAD & FORM GRINDERS
OPTICAL COMPARATORS • AUTOMATIC OPENING THREADING DIES & CHASERS



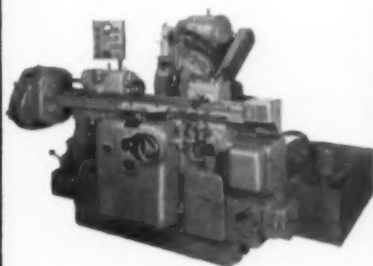
AUTOMATIC HANDLING

Completely automatic operation of this Fay Automatic lathe, including loading, machining, chip and coolant disposal and unloading, ups production to 180 pcs. per hour at 100% efficiency in the machining of these shells.



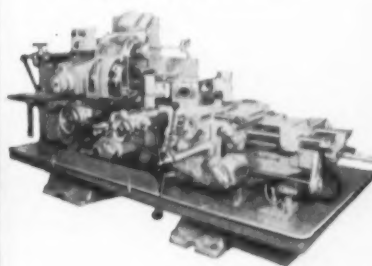
NEW METHODS

By grinding this worm (stock removal .1235" — one pass) on a J&L 6 x 36" Automatic Thread Grinder, production is increased 160% per machine over previous methods.



VERSATILE TOOLING

High production methods of tooling for automatic lathes were simplified and applied to three 7B J&L Universal Turret Lathes. Inner and outer Ball Bearing Races are produced on the same machines. Set up time from one lot to the next does not exceed fifteen to twenty minutes per machine.



Jones & Lamson's unique Procurement Plan offers you a choice of methods for procuring new, high-efficiency equipment. You may buy outright; pay-from-productivity on a variety of bases, at interest rates of 3¼% and lower (add-on); or you may use any of several variations of a truly flexible lease plan.

MACHINE TOOL DIVISION

Valuable information is yours for the asking. Simply fill in the coupon below, clip it to your letterhead, and mail.

Jones & Lamson Machine Company
511 Clinton St., Dept. 710,
Springfield, Vermont, U. S. A.

Please send me the Jones & Lamson Machine Tool Replacement Information Kit.

Name

Title

STANDARD

technical service clicks at Argus Camera

Personnel at Argus Camera Company were having trouble with the grinding of thread plug gauges. Grinding oils used failed to hold the required accuracy. They called in L. H. Walker, Standard Oil industrial lubrication specialist. He recommended Standard's SUPERLA Thread Grinding Oil A, and Argus began using it. That was four years ago. What happened? SUPERLA Thread Grinding Oil has helped Argus grind thread plug gauges with such accuracy, so consistently, rejects are virtually eliminated. Small job? Yes. Small volume of oil used? Yes. But the results are big business to Argus Camera. That makes it important to Standard Oil. It is another demonstration of what this unbeatable combination can do when put to work:

- 1 Standard lubrication specialists capable of giving technical help.
- 2 Top quality products that deliver results required.

Put this combination to work in your plant. In the Midwest there is a lubrication specialist in your nearby Standard Oil office ready to help you. Call him. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY
(Indiana)



Omer L. Parks (left), tool and gauge grinder for Argus Camera, inspects thread plug gauge with L. H. Walker, Standard Oil industrial engineer. Lyman Walker has been working with customers for 25 years helping them solve problems like the one at

Argus. A native of Detroit, Lyman Walker is familiar with the lubrication problems of industry in the territory he serves. This together with his wide experience makes him ideally qualified for this work. Customers find his experience pays off for them.

(Advertisement)

New High-Torque Unbrako self-locking socket set screws

set them, forget them—they stay tight

*Up to 40% higher
tightening torque—
a new Unbrako feature*

RECOMMENDED SOCKET SET SCREW TIGHTENING TORQUES (Inch-Pounds)

SCREW SIZE	UNBRAKO	B	C	MINIMUM DIFFERENTIAL %
#4	5	3.9	3.5	28
#5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
#10	33	26.5	25	25
1/4	87	62	60	40
5/16	165	122	125	32
3/8	290	198	225	29
7/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
1	7000	5025	6500	8

All UNBRAKOS can withstand higher tightening torques than ordinary set screws. For example, the recommended torque for a 1/4" UNBRAKO is 87 inch-pounds—40% greater than that recommended for an ordinary set screw.

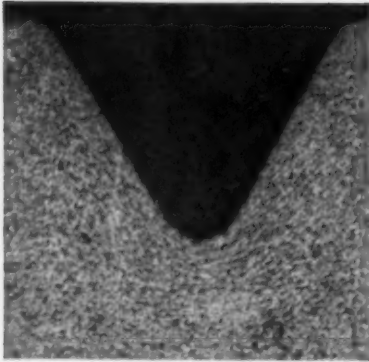
Research has proved that the tighter you seat a set screw the better it works. We went to work to design a socket set screw that could be tightened tighter than ever before without damaging the screw.



We formed a deeper socket. We put a radius in the socket corners. We developed fully formed threads. We established new methods of heat treatment in atmosphere-controlled furnaces. It took almost 6 years' research and development, but the new High-Torque UNBRAKO incorporates all of these improvements. And it retains the self-locking knurled cup point that keeps an UNBRAKO tight up to 48 times as long as a plain cup point set screw, regardless of the size of the point or the cup.

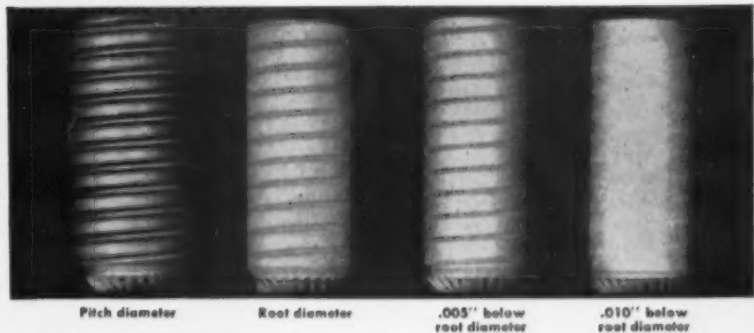
(Advertisement)

UNBRAKO SET SCREW

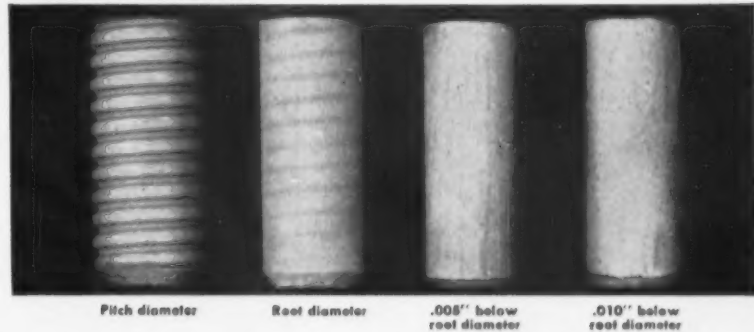


We fully form the threads—make the whole screw stronger. The metal is compressed into the closely knit grain structure that you see in this illustration. The grain flow follows the contour of the threads. There are no straight lines along which shear can occur. The UNBRAKO retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

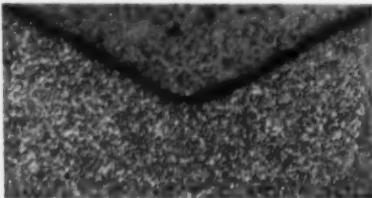
UNBRAKO SET SCREW



ORDINARY SET SCREW



UNBRAKO SET SCREW

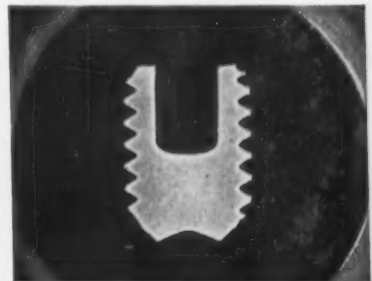


We put a radius in the socket corners—eliminate the sharp corners where cracks start. This distributes the stresses developed when tightening torques are applied. Ordinary socket screws have sharp corners which often crack when tightened even at lower recommended torques.

UNBRAKO SET SCREW



ORDINARY SET SCREW



UNBRAKO SET SCREW



ORDINARY SET SCREW



We form a deeper socket—give you more purchase with the wrench. Since more wrench can be put into the UNBRAKO socket, you can set the screw much tighter. And you won't ream the socket or round the corners of the wrench.

We heat treat an UNBRAKO properly. It's a ticklish job to heat treat a socket set screw. If you don't do it just right, you get decarburization. And decarb plays havoc with a screw. Put a wrench in the socket and you ream it. Run the screw into a tapped hole and you strip its threads. Try to seat the screw and its point shears off. These photos show the good and the bad. The UNBRAKO is clean. Its grain structure is uniform. There is no decarburization—the ordinary screw is suffering from an overdose of it, socket walls, threads and point are full of the telltale white spots.

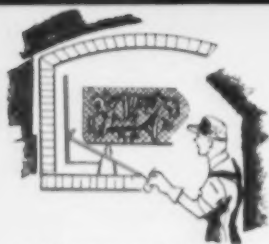
You can't buy another set screw as good as an UNBRAKO. See your authorized industrial distributor today. Or write STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.



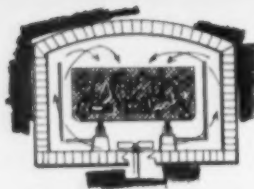
SOCKET SCREW DIVISION



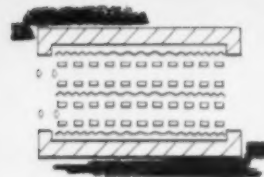
JENKINTOWN, PENNSYLVANIA



Safety! Extremely low voltage makes CORRATHERM elements completely safe. Let operator or work load bang it if they will. Neither element nor operator will be hurt.



CORRATHERM elements act as natural baffles to direct forced convection streams through the charge. The use of electric furnaces for carburizing and carbonitriding is now practical.



In continuous type furnaces CORRATHERM elements hang between lines of work as well as on side walls. Note how closer corrugations (at each end of element) compensate for incoming cold work and door losses.

NEVER BEFORE ANY ELECTRIC ELEMENT LIKE THIS NEW ONE BY LINDBERG

On the opposite page is a photograph of Lindberg's new CORRATHERM element for electric heat treating furnaces. You can see how radically advanced this element is over anything now used.

Wherever electricity is the preferable source of heat for metal treating the CORRATHERM element now makes its use practical, efficient and economical.

And this includes carburizing and carbonitriding furnaces, too! Problems created by the use of electricity in these types of furnaces are well known. CORRATHERM elements eliminate them completely. These facts tell you how and why:

LOW VOLTAGE: Operates at extremely low voltage. No leakage through carbon saturation. Around Lindberg we talk about it as the electric element "without any electricity...to speak of!"

ATMOSPHERE CIRCULATION: Elements act as baffles to direct circulation of convection streams.

SAFETY: Extremely low voltage also eliminates shock or short hazards.

DURABILITY: Watts density at all-time low. Element practically indestructible. Work load or operator's charging tool can't hurt it.

EASILY INSTALLED: Element is not enclosed, just hangs in furnace. No complicated mountings required.

CORRATHERM, Patent No. 2694740 (other patents pending), was developed in Lindberg laboratories, by Lindberg metallurgists and engineers. To find out just how its advantages can be applied to your heat treating processes get in touch with your Lindberg Field Representative. (See classified phone book.)

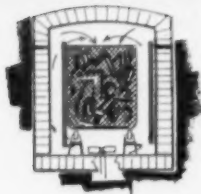
LINDBERG ENGINEERING COMPANY

2452 West Hubbard Street, Chicago 12, Illinois

Los Angeles Plant: 11937 Regentview Ave., at Downey, California



If you are in Chicago during the period of the three shows, September 6 to 16, plan on attending one of the special showings of this new element at our plant. Just phone MOnroe 6-3443 and we'll make the arrangements.



No retort needed in pit-type carburizing furnace with CORRATHERM elements. Again see how elements serve as baffles to direct forced convection stream through charge.

CORRATHERM

by LINDBERG

big industry, small world



annealing covers
billet reheating furnaces, continuous
carbon restoration and annealing furnaces, continuous
controlled atmosphere generators
high-speed stress relieving furnaces
one-way fired soaking pits
pit-type annealing furnaces
slab and billet heaters, continuous
strip annealing furnaces, continuous
strip galvanizing lines, continuous
wire patenting furnaces, continuous

Wherever this steel goes—from first soak to final shipping dock—it will find that the big steel industry is a small world as far as 'Surface' equipment is concerned. Somewhere along the line, whatever its destined shape, the steel will be made more workable and more useful in 'Surface' furnaces.

Why is it so easy to bump into 'Surface' in steel mills? One reason is that 'Surface' has literally grown up with the steel industry. A better reason is the confidence that steelmakers have in the performance of furnaces and generators manufactured by Surface Combustion Corp., Toledo 1, Ohio.

Surface

STEEL MILL FURNACES



Foreign associate companies:

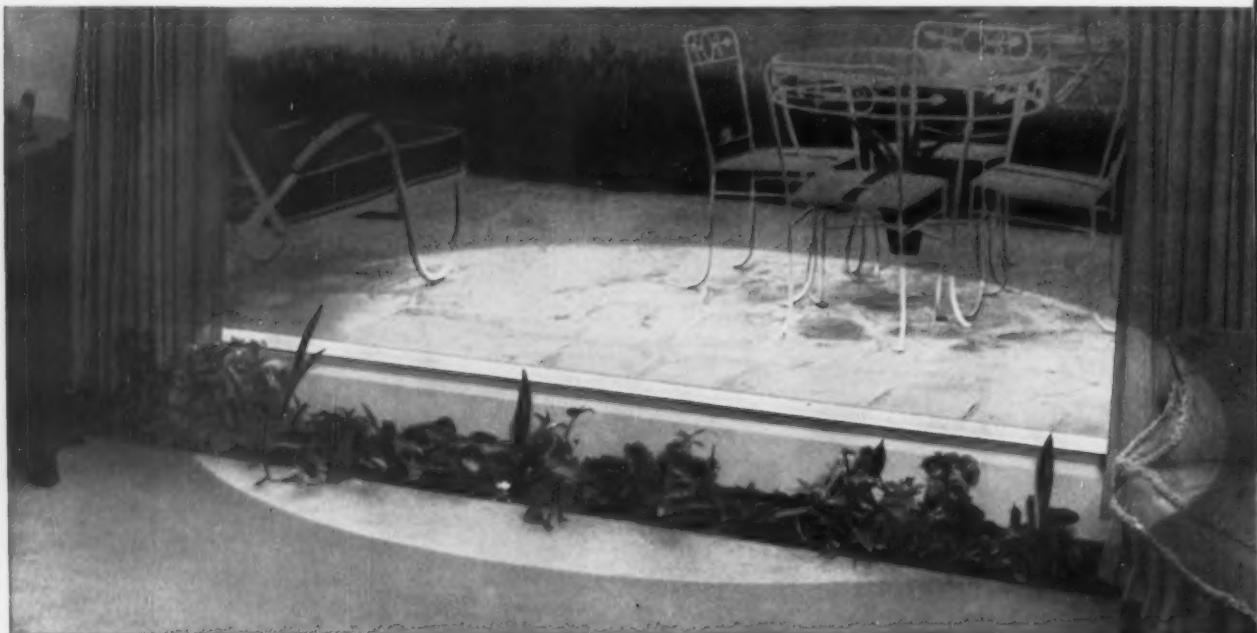
British Furnaces, Ltd., Chesterfield; Stein & Atkinson, Ltd., London

Stein & Roubaix, Paris, Leige, and Genoa; Chugai Ro Kogyo Kaisha, Ltd., Osaka

Benno Schilde Maschinenbau, A.G., Bad Hersfeld (Hessen, Germany)



solves a "hot" Republic Electro



General Automatic Products Incorporated, Baltimore, Md., a manufacturer of baseboard radiation for the home, embodies a snap-lock design in its units which involves exceptionally severe roll-forming in 22-gage steel sheets.

Since these units must take a high-quality

painted finish, it's extremely important that the surface of the metal is in no way damaged during the forming operation.

To solve this problem, General Automatic Products uses Republic Electro Paintlok—the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels and hold them for years, even under hard service.

One of the important advantages of Electro Paintlok is the ability of its zinc coating to remain absolutely tight during bending, rolling, punching and shearing operations—with no fracturing, no cracking, no peeling or flaking.

There are other money-saving advantages, too. The entire finishing operation is speeded because Electro Paintlok requires no costly cleaning before painting. Only the removal of finger marks, fabricating oils, and warehouse dust is necessary. Surfaces are pre-conditioned. No pre-etching is required.

REPUBLIC STEEL CORPORATION

3104 East 45th Street
Cleveland 27, Ohio



Please send more information on:

- ☐ Republic Electro Paintlok Steel
- ☐ Free-Machining ENDURO®
- ☐ Steel and Tubes Fabricating Facilities
- ☐ ENDURO Stainless Steel

Name _____ Title _____

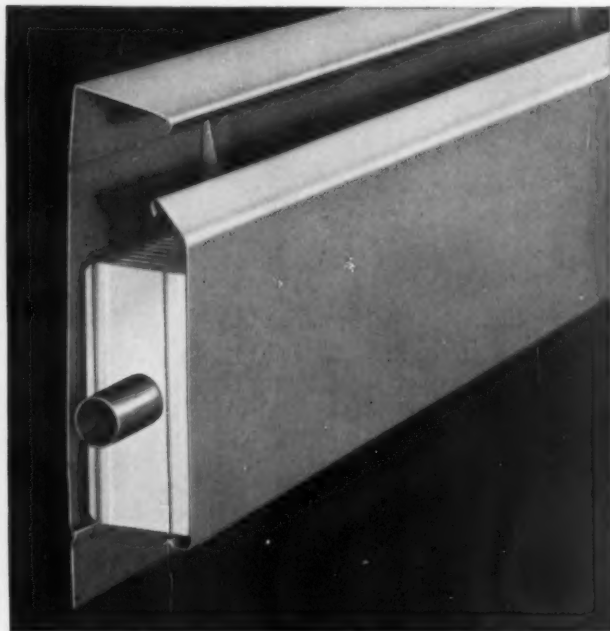
Company _____

Address _____

City _____ Zone _____ State _____

SC-47047

problem with Paintlok



And, when sheets are held in stock for long periods under approved warehousing conditions, the tight zinc coating protects against rust and corrosion.

If you have a painted or enameled steel product that needs to look better longer, it will pay you to get the full story on Republic Electro Paintlok. Send coupon for Booklet 655 today.

REPUBLIC STEEL

*World's Widest Range
of Standard Steels and Steel Products*

Republic specializes in solving problems



WHERE DEEP DRAWING IS DESIRABLE to avoid the high cost of successive draws, Republic ENDURO Stainless Steel is ideal. Its high ductility and elongation makes it possible to deep-draw a circular blank in one stamping operation with less danger of tearing or fracturing. Bonus advantages built into the washing-machine tub shown above include added strength, better appearance and a lifetime of corrosion resistance. Republic metallurgists and engineers will give you free assistance on applications, processing and uses of Republic ENDURO Stainless Steel. Send coupon for facts.



IF MATERIAL COSTS ARE HIGH ON TUBULAR PARTS, it may pay you to use Republic ELECTRUNITE Mechanical Steel Tubing. These lamp parts, display stand legs and furniture legs were previously made of cast brass, bronze, white metal or heavy-gage tubing. Using light-gage ELECTRUNITE effected substantial weight savings...plus the desired strength and appearance. One of the above tapers reduces ELECTRUNITE Tubing from 1 1/2" O.D. to 3/4" O.D. in a 6" length without metal fracture. If you use tubing for long or short tapers, send coupon for facts on ELECTRUNITE.



IF STEEL PART PRODUCTION RATES ARE LOW, UNIT COSTS HIGH, you can solve the problem with free-machining ENDURO Stainless Steel Bars. They'll machine beautifully at every station on your automatics—and at rates up to 90% of Bessemer screw stock. And you'll get the added strength, appearance, and heat- and corrosion-resistant qualities of stainless steel. Republic ENDURO Stainless is available in cold-finished and hot-rolled bars, special sections and wire. For more information, mail coupon.



0.28/0.33	0.40/0.60	0.040	0.040	0.20/0.35	0.80/1.10	0.15/0.25
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4130 steel is your best bet for light sections



4100 steels are your best bet

Chromium Molybdenum Steel like AISI-SAE 4130 is the answer for parts requiring high strength and toughness in light sections. For aircraft parts, heat-treated compressed gas cylinders and other thin sections, the move is to plentiful Moly. For information, write Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.



CLIMAX MOLYBDENUM

Eriez Permanent Magnets

to CONVEY . . . HOLD . . . CONTROL

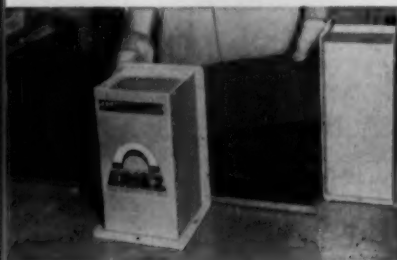
offer new automation advantages

● A revolutionary new concept in steel conveying and controlling is now possible through the use of Eriez Permanent Non-electric Magnets. Famous for years as magnetic separators to remove tramp iron from processing lines of all kinds, the introduction of these magnets into the metal working industry has offered many new ideas in automation. Powerful enough to stop moving metal, these magnets can also convey pipe, tubes, conduits, sheet metal, etc., at high speeds to maintain peak production. Other advantages include: faster pickup, more positive movement, less conveyor space needed, less product damage caused by slippage and sag, elimination of electric motors, etc. *All Eriez Magnets are non-electric, self-contained. They have no wires or attachments. There is no operating cost; first cost is the last. Powerful Alnico V elements are guaranteed to keep their strength indefinitely. Write for Big New "MAGNETS FOR METAL WORKING" Bulletin.*

Magnetic ideas from



ERIEZ



ERIEZ SHEET FANNER MAGNETS. Here's the magnet to speed up sheet metal handling and increase production. Slow, costly hand separation is completely eliminated . . . no more double feeding, no scratched surfaces, no cut fingers. An Eriez Sheet Fanner Magnet placed next to a pile of sheet metal automatically lifts the top sheet into the air, allows fast, safe removal. When this sheet is removed, the following one automatically rises. Ideal for irregular, odd-shaped sheets. Available in five strengths.



ERIEZ SMALL-DIAMETER MAGNETIC ROLLS (Not-faced). These powerful, permanent magnetic rolls are destined to play a major part in plant automation. Installed either singly or in groups, they are used for feeding, conveying and spot control of sheet metal and they assure absolute control during such operations as baking, painting, trimming, etc. They eliminate drifting, untrue cuts, cobbles . . . reduce downtime and rejects. They permit automatic feeding of stock for cutting, punching and shearing operations. Rolls can be coated for special needs, or chrome plated for longer wear. In 2½", 4", 4½" and 5" diameters. Easily installed on present systems.



ERIEZ CONTROL PLATE MAGNETS (Not-faced). Designed for installation under fast-moving belts, powerful plate magnets are used to control moving sheets and keep them in proper position during conveying operations. True feeding into machinery is assured, and there's never a chance of flopping or "take-offs." Constant magnetic power prevents sheets from damaging each other, reduces rejects and waste. Available in various sizes and strengths, in widths from 4" through 72", in 2" increments. Readily adaptable to existing conveyor lines.

Eriez "Magnetic Ideas" can help you. Eriez factory-trained field men, backed by extensive laboratory and engineering know-how, will be happy to study your particular metal handling problem and offer helpful "Magnetic Ideas." Our representatives are always glad to work with your engineering department or consulting engineers on any problem, large or small. For additional information concerning magnetic problems in the metal working industry, write for new bulletin B-207. Address Eriez Manufacturing Company, 100W Magnet Drive, Erie, Pennsylvania.

AND HOLDING ON BY A MAGNET. There's quite a drop beneath this worker . . . but he's in no danger. He is holding on by a permanent-powered Eriez Magnet. This idea of permanent dependability and herculean power now offers the metal working industry many new ideas for automatic control and conveying of steel. Hundreds of other production problems have also been solved by the use of many types of Eriez Permanent Magnets designed to separate, retrieve and purify.

ERIEZ V-TYPE MAGNETIC PIPE CONTROL ROLLS. These V-grooved rolls are used to control and convey pipe from one location to another, either horizontally, vertically or up steep inclines at speeds that permit capacity production. They decrease take away time, make for shorter conveyor lines, and eliminate many direct drive rolls and motors. Positive hold prevents rebound, assures absolute control during all operations such as cut-off, reaming and facing, coupling, threading, and conveying through coating operations. Available for medium and heavy duty.





PRIME MOVER. Here a wire belt is conveying pottery from a baking kiln to the decorating department. Wire belts, woven from CF&I-Wickwire Wire, are used to convey everything from heavy metal parts to fluffy foam rubber during processing operations.

**CF&I-WICKWIRE
MAKES WIRE FOR
THOUSANDS OF USES**



SHELF HELP for the housewife. These dish-washer shelves are made of selected low carbon rods of CF&I-Wickwire Refrigerator Shelf Wire. Specifications call for an extra-clean, smooth, bright surface for plating.

*from making dishes for the manufacturer
to washing them for the housewife...
nothing can take the place of wire!*

Wire can answer an almost incredible variety of needs because it can be varied to provide thousands of different combinations of mechanical and physical properties. From wire that can be easily twisted by hand to a rigid, self-supporting wire, it can be "tailor-made" to meet almost any set of requirements.

Whatever you assemble, manufacture, or process, let CF&I-Wickwire Wire help

you do the job better, cheaper, and faster. You'll like doing business with CF&I-WICKWIRE and the careful attention given your own particular requirements.

CF&I-Wickwire Wire is made in plants conveniently located throughout the nation, from coast to coast. For detailed information, write our nearest district sales office.



WINDOW DRESSING. All kinds of draperies are hung on rods by means of strong, inexpensive drapery pins made from CF&I-Wickwire Drapery Pin Wire.



"RIBS" FOR HOSE. The rubber hose in grease guns is strengthened by basket-weave braided CF&I-Wickwire Hose Reinforcement Wire to help withstand high internal pressures. This wire is also used for rubber hoses in hydraulic brake lines and in hydraulic lines for aircraft.



FOR BACKYARD EXERCISE. These rake teeth are made of CF&I-Wickwire Rake Tine Steel Wire (flat scaleless tempered Spring Steel Wire).

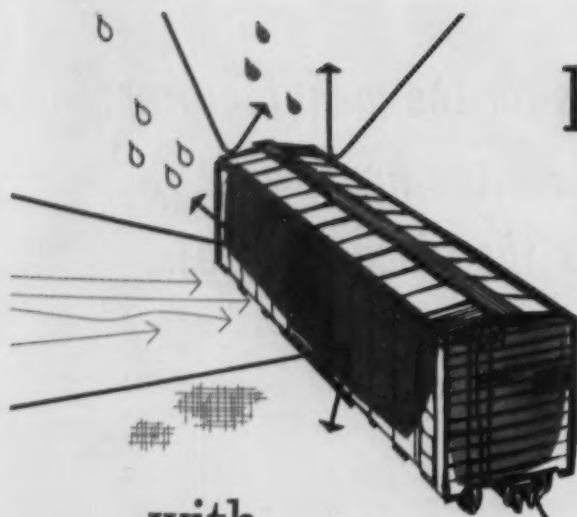


ALL SECURE. The spring used in this lockset is made from extra-tough CF&I-Wickwire Lock Spring Steel Wire to insure long, dependable life.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver
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PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
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how to rust-proof a freight-car with **FERRO-PAK[®]**

by Cromwell

A leading wire manufacturer discovered this economical, easy way to use Cromwell Ferro-Pak VCI Paper to insure rust-free shipping of bright finished wire. Wire coils are shrouded with sheets of Ferro-Pak and the paper is used to line the sides of the car as well. Chemical vapors travel outward from both sides of the paper, forming an invisible protective film around the wire that doesn't give rust a chance to get a foothold. Non-toxic Ferro-Pak vapors are effective almost indefinitely under most conditions.

Think how this clean, fast, easy rust preventive method

can save you money! No more dipping, alushing, scraping, wiping. No more costly extra packaging. To protect any ferrous metal product, you simply wrap it and it's rust-proofed—unwrap it and it's ready to use. Ferro-Pak comes in rolls, sheets, bags, envelopes, liners and covers. And we combine it with many other materials for a wide range of special uses.

For an interesting brochure on how you can cut costs with Ferro-Pak in packaging, shipping, storage and maintenance, write on your letterhead today.



Cromwell

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MANUFACTURERS OF: Papers (Impregnated • Coated • Laminated • Reinforced • Flexible) Bags • Sacks • Liners • Covers • (Single and multiwall construction, using all types of material to carry, cover or protect all types of products.)

See you in
Booth #604
at the
SIPHME Show

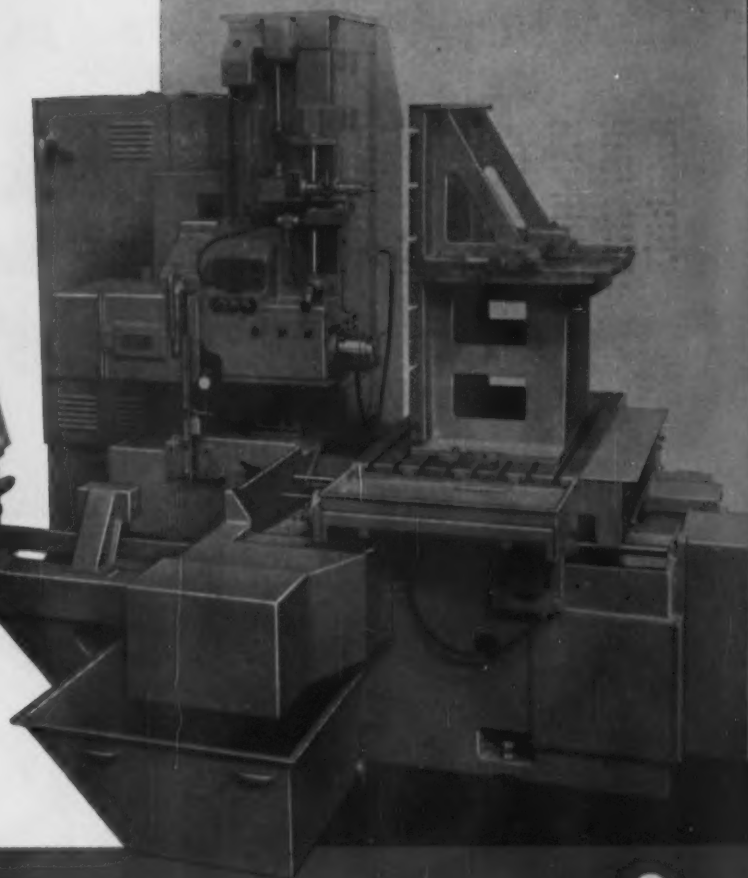
*Shrouding with
Ferro-Pak VCI Paper
quickly transforms an ordinary
freight-car into a huge
rust-proof package.*



AND NOW A NEW PRATT & WHITNEY KELLER

AUTOMATIC
TRACER-CONTROLLED
MILLING

MACHINE



THE BL 3622

MODEL C

WITH THESE IMPORTANT NEW FEATURES . . .

- **HEAVIER, MORE RUGGED** . . . to take tough production schedules in stride day after day.
- **MORE POWER (10 hp)** . . . for increased metal removing capacity on today's tough new alloys.
- **BIGGER CAPACITY** . . . to handle larger, heavier workpieces.
- **WIDER RANGE of SPINDLE SPEEDS** . . . with a single, full-range spindle for all speeds . . . 30 to 3600 rpm in 20 steps. Spindle furnished with either No. 12 B&S or No. 50 MM taper bore.
- **POWER DRIVEN CHIP CONVEYOR** . . . no need to stop and shovel chips piled up by fast metal removal.
- **FASTER TRACER RESPONSE** . . . through a new electronic control of machine motions, travel speeds, and feeds.

- **PHENOLIC-TO-METAL BEARING SURFACES** . . . eliminate scoring of ways and preserve original high accuracy.
- **OPTIONAL RAPID TRAVERSE** . . . for vertical and horizontal movements.
- **ONE-SHOT LUBRICATION SYSTEM** . . . insures quick, positive thorough lubrication of all important sliding surfaces.

The NEW BL 3622, Model C is a powerful, horizontal spindle miller that reproduces the shape of any 2-dimensional template or 3-dimensional full model quickly and accurately. Complex or irregular dies, molds, prototypes and other workpieces that cannot be conveniently machined by any other method are handled as easily and economically as simple work. The Keller BL Machine is built *specifically* for tracer-controlled milling — not just "adapted". It is rugged, dependable, relatively simple . . . stays on the job year after year.

PRATT & WHITNEY

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FOR COMPLETE INFORMATION . . . write on your Company letterhead for P&W Circular No. 588 . . . or phone the P&W Branch Office near you.

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MACHINE TOOLS • CUTTING TOOLS • GAGES

1860

DoALL COMPANY ENGINEERS GET...

HIGH STRENGTH

with NO HEAT TREAT DISTORTION

by specifying

STRESSPROOF®

SEVERELY COLD-WORKED, FURNACE-TREATED
STEEL BARS

on key
operating parts



The new giant DoALL Contourmatic band saw — the world's largest — is a key part of the Air Force's "Heavy Press Program." STRESSPROOF is used on important operating parts.

The lead and feed screws on the new DoALL Contourmatic must be strong since they transmit power. These important lead and feed screws must also be straight and free from growth and shrinkage, since upon their accuracy depends the accuracy of the huge extrusion dies machined on the saw. STRESSPROOF gives them this strength and accuracy.

STRESSPROOF was specified because it eliminates heat treating and its attendant distortion and warpage problems. In addition, STRESSPROOF wears well, has the necessary strength and is easily machined.

STRESSPROOF makes a better part at lower cost.



Write for helpful data bulletin No. 15... "Improve Quality — Cut Costs"

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COAST-TO-COAST



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1436 150th Street, Hammond, Indiana

MANUFACTURERS OF AMERICA'S MOST COMPLETE LINE OF
QUALITY COLD-FINISHED STEEL BARS


GRAY

is out of this world

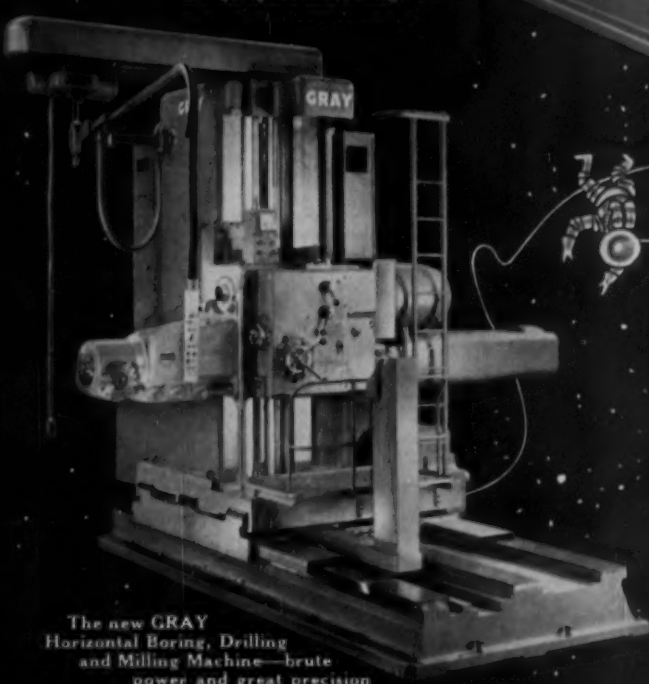
Out-of-this-world thinking has produced down-to-earth features that speed handling, loading, maintenance and, of course, machining. Gray design is aimed at cutting *all* your costs, further proof that

Quality doesn't cost . . . it pays.

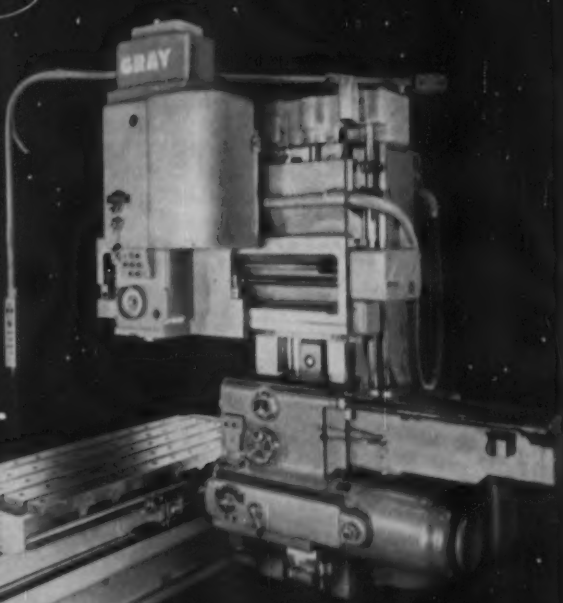
The G. A. GRAY CO.
Cincinnati 7, Ohio



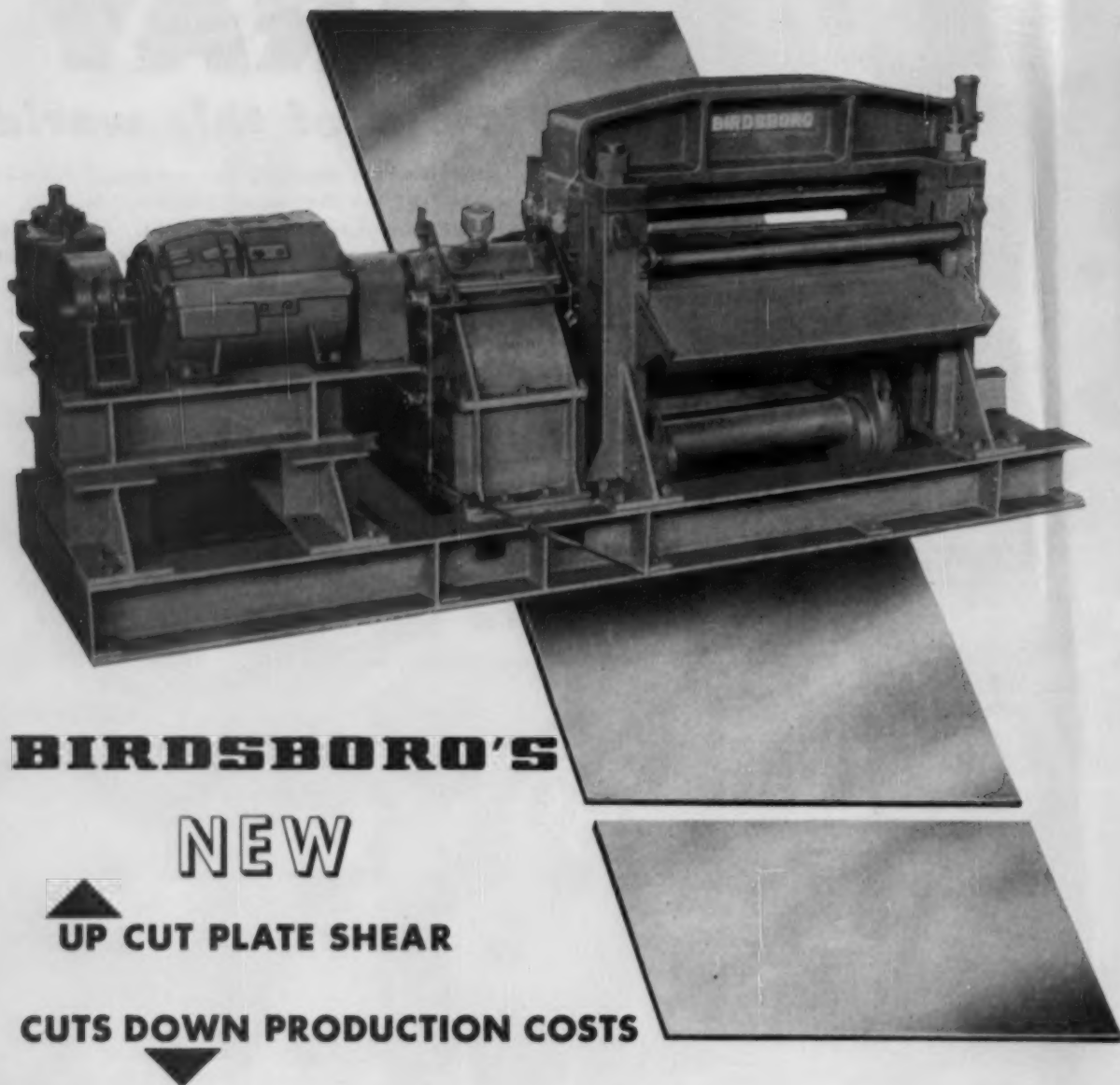
The new GRAY Universal Planer—single cuts, double cuts, triple cuts, and cross cuts—a revolutionary concept in high-speed machining.



The new GRAY Horizontal Boring, Drilling and Milling Machine—brute power and great precision with versatility unlimited.



The new GRAY Handymill—at long last a powerful, rigid milling machine for the medium size job.



Designers and Builders of:

STEEL MILL MACHINERY

HYDRAULIC PRESSES

CRUSHING MACHINERY

SPECIAL MACHINERY

STEEL CASTINGS

Weldments "CAST-WELD" Design

ROLLS: Steel, Alloy Iron, Alloy Steel

● Talk about a *tough* cutting job! 175,000 lbs. shearing strength is required to bite through $\frac{3}{8}$ " thick stainless steel plate up to 62" wide. BIRDSBORO helped supply the answer... with a new start-stop type of Up-Cut Plate Shear. Special provisions protect the lower knife slide from scale contamination. Producing new type shears is an old story for BIRDSBORO. For over a half-century, BIRDSBORO service has been handled by a series of design, engineering and production experts who can produce machinery to fit any of your requirements.

MM-48-55

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

Do you store and handle steel wire?



USS AMERICAN MANUFACTURERS WIRE



AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

The storage and handling of steel wire coils is an art all its own. So if you are faced with the problem, why not take advantage of the free advice offered by American Steel & Wire?

Your AS&W representative will be glad to go over your present or future warehouse and handling facilities. After sizing up the situation, he may be able to offer sound advice that will save you many thousands of dollars every year.

It's a big problem, involving the most economical size coils to order, the most efficient in-plant handling methods, and how to store the coils until they are used. If you contemplate the design of new wire fabricating equipment, your AS&W representative can give you valuable design information. That way, you can be sure that the machinery you design can be served with approved handling equipment, and use lower cost, standard steel wire coils.

Want to take us up on the offer? Just call your local AS&W salesman.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

AMERICAN MANUFACTURERS WIRE

AMERFINE—High quality fine wire.

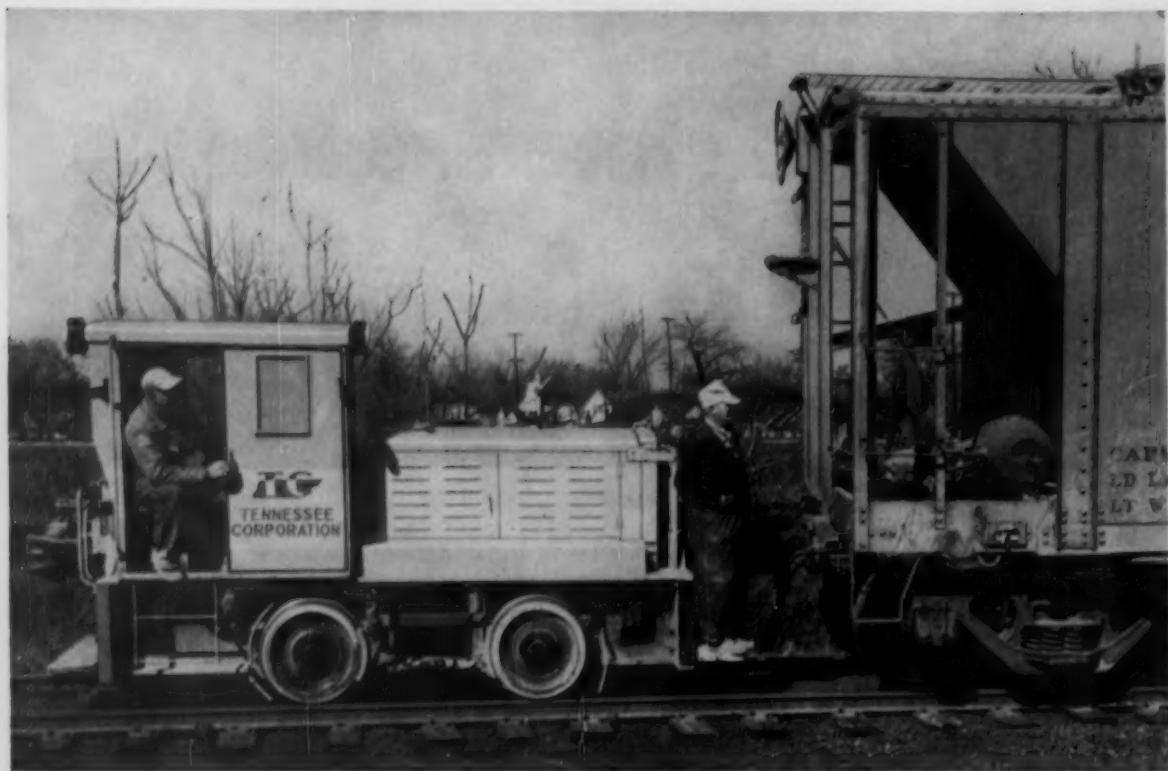
AMERSPRING—music steel spring wire.

AMERLOY—alloy heading wire.

AMERTEMP—heavy-duty oil-tempered wire.

AMERHEAD—uniform heading wire.

AMERSTITCH—extra-tough metal stitching wire.



10-Ton Plymouth Diesel Torqomotive . . .

"Powerful Pusher with a Small Appetite"

at Tennessee Corporation, New Albany, Indiana

"Fuel economy is one of the best features of our Plymouth Model DGT Torqomotive," says S. H. Peden, Superintendent at Tennessee Corporation's New Albany fertilizer plant. "Our figures show the Plymouth operates 30 actual hours every week. In the past 31 months, fuel consumption has averaged 900 gallons per year. That's less than six-tenths of a gallon per hour, and certainly a meager diet for so powerful a pusher!"

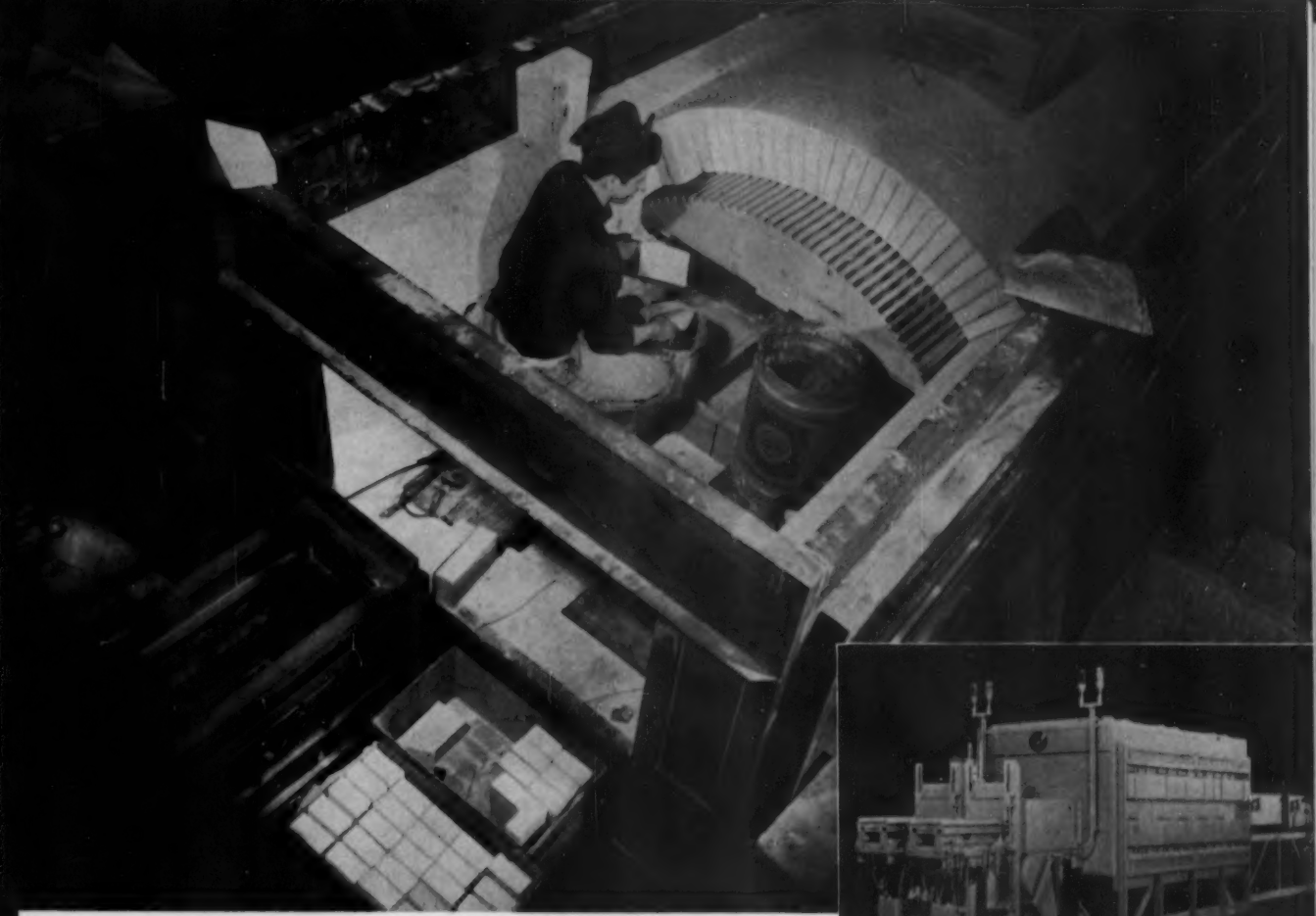
"The Torqomotive Drive contributes further to our savings in time and costs. The hydraulic torque converter eliminates shifting of gears under heavy loads of raw material and finished fertilizer. Steady power for smooth starts and stops and the end of coupling shocks are other benefits."

There's a moral for you in Mr. Peden's story, because there's a Plymouth Locomotive designed to give you top efficiency, economy and easy operation. Models from 3 to 70 tons. Gasoline or Diesel, mechanical or Torqomotive Drive.* Get full details and specifications in free illustrated catalog by writing: PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Dept. A-2, Plymouth, Ohio.

PLYMOUTH® TORQOMOTIVES

*TORQOMOTIVE DRIVE: Plymouth Transmission
Coupled to a Hydraulic Torque-Converter

ALSO BUILDERS OF F-R-H CERAMIC MACHINERY



↑ A lining of Lightweight B&W IFB Refractories being installed in Harper electric sintering furnace.

Refractories Maintenance Cut Down ON HARPER ELECTRIC FURNACES AND KILNS

"Furnace linings that don't last as long as they should can shoot our customers' production costs 'sky high'—and take a big bite out of their profits."

That's one of the reasons why Harper Electric Furnace Corporation standardized on B&W Insulating Firebrick for the electric kilns and furnaces which they manufacture. They know from experience that "B&W IFB last longer than any insulating firebrick we ever tried."

The reason? Volume stable raw materials, unique quality control and manufacturing processes, including B&W's exclusive double burning at temperatures well above use limits—all these factors contribute to more uniform brick and longer life.

B&W IFB, the lightest weight insulating firebrick, also offer these advantages:

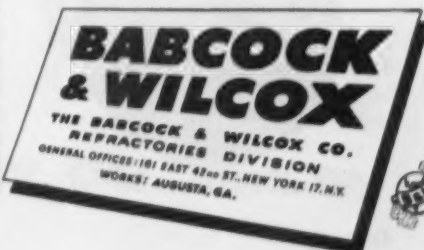
Cut electricity or fuel costs—Lighter in weight than any other insulating firebrick, B&W IFB store and conduct less heat. This means faster heating up time, less heat loss during furnace operation. Results? Lower electricity or fuel consumption—often 30% to 50% less than with ordinary heavy firebrick.

Cut installation costs—Hand fitting is easy and fast—B&W IFB can be cut, drilled or shaped on the job with ordinary hand woodworking tools.

Cut down-time—B&W IFB cool off quicker because they store less heat

—make possible quick access to the furnace for inspection. Furnace gets back on the line faster, too, because B&W IFB heat up quickly.

These savings explain why B&W Insulating Firebrick are being used in thousands of applications . . . from the largest industrial furnaces to the smallest kilns. Contact your local B&W Refractories Engineer. He may point the way to new savings in your furnace.



B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars



Blank size: $\frac{3}{8}$ " thick x $16\frac{1}{2}$ " x $23\frac{1}{2}$ "



Blank size: $\frac{3}{8}$ " thick x 9" x 31"



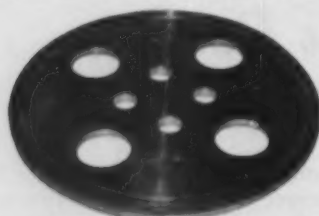
Blank size: 5" thick x 78" OD



Blank size: 4" thick x $7\frac{3}{4}$ " x $71\frac{3}{4}$ ".
Illustrations show before and after machining.



All the products illustrated here were flame cut, sawed, abrasive cut, sheared or machined from stainless steel plate.



Blank size: 2" thick x 60" OD

Stainless steel plate produced to your specifications for quick delivery

Confidence in Carlson service has made G. O. Carlson, Inc. the country's leading specialist in stainless steel plate. As we grew to this position in the industry, we learned and developed new methods of working stainless plate.

What does this mean to you?

It means you can buy for quick delivery exactly what you need in stainless steel plate—sheared, sawed, flame cut, abrasive cut, or machined. And this is true whether the job is a "toughy" or "run of the mill"!

When you need stainless steel plates—special patterns like these or plain rectangles—you'd better try Carlson service, where experience pays off.

write for CARLSON'S WEEKLY STOCK LISTS . . .
YOUR GUIDE TO WHAT'S AVAILABLE
IN QUALITY STAINLESS STEEL

G. O. CARLSON, INC.
Stainless Steels Exclusively

THORNDALE, PENNSYLVANIA

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)
District Sales Offices in Principal Cities



Blank size: $3\frac{1}{4}$ " thick x $106\frac{1}{2}$ " OD



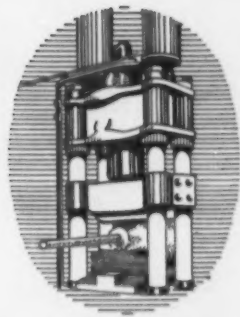
Blank size: $\frac{1}{4}$ " thick x 73" x 88"



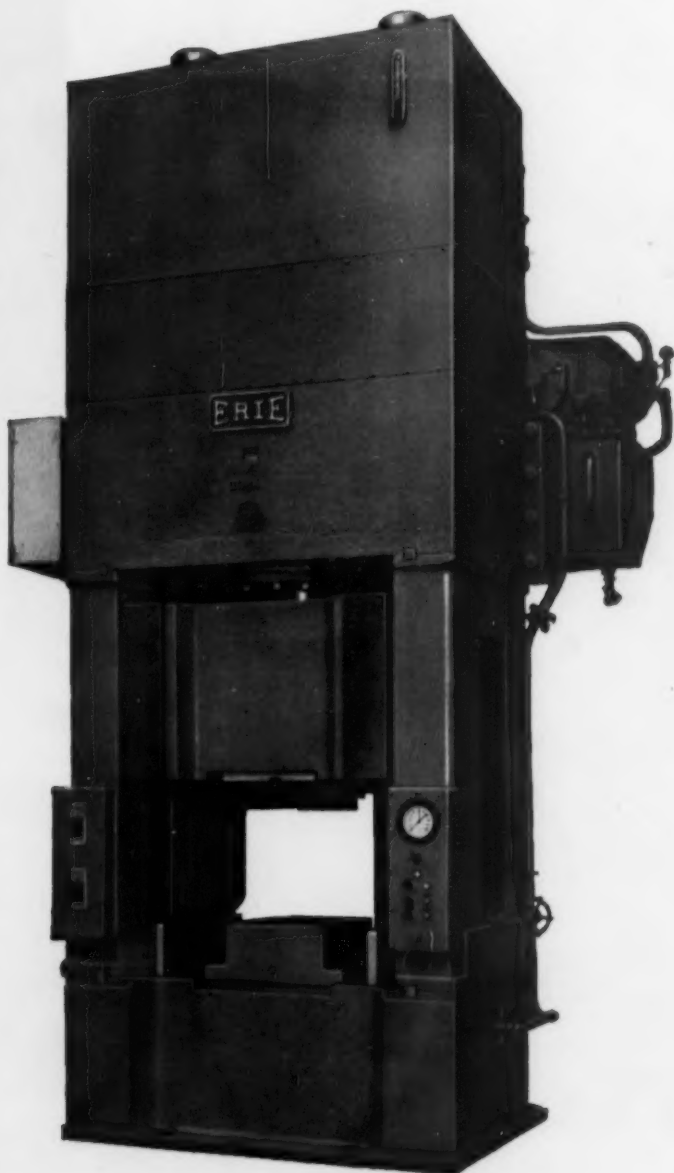
Blank size: $1\frac{1}{2}$ " thick x 26" OD

in the good old days

When press forging was done on steam hydraulic presses,
water intensified . . . power strokes were short and slow.



Even then ERIE was the greatest name in forging machinery in both presses and hammers . . .



today

Erie Foundry has just built this extremely fast hydraulic forging press. This 1000-ton semi-automatic machine, used to forge jet engine turbine blades by a special process, completes a 6" stroke cycle in just 4 seconds.

Its high speed is achieved by using two self-contained pumps. This forging press incorporates speed control with automatic pressure and precision reversal by means of a special compression and decompression feature, designed by Erie hydraulic engineers. Maximum stroke is 28". A long (1 to 1) guide ratio insures accuracy. By combining side housing and strain rod construction, the machine is made rigid and produces perfect forgings.

Just one more indication of why Erie Foundry is today the greatest name in forging machinery.

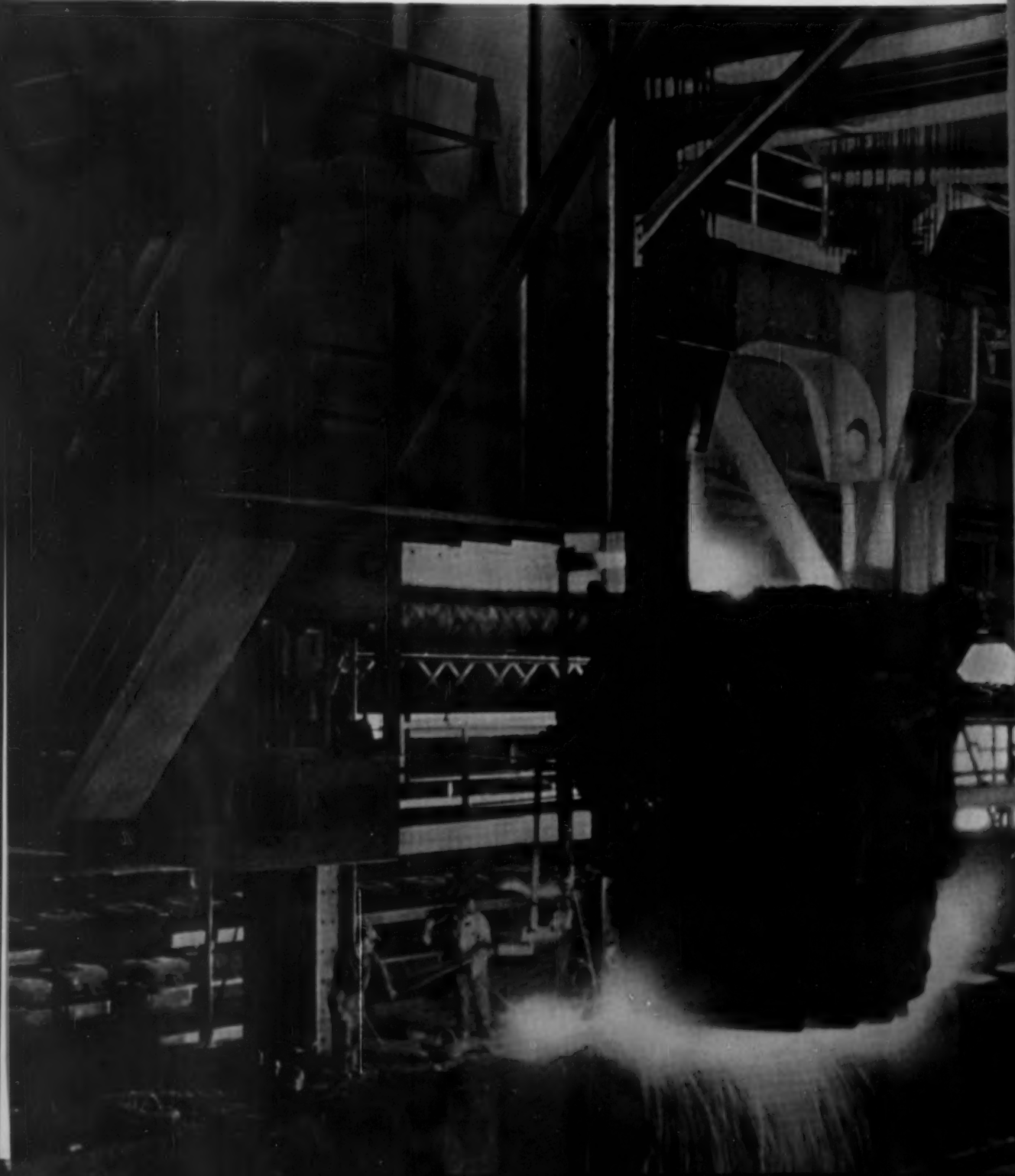
in our 60th year



ERIE FOUNDRY CO. ERIE, PA.

For Youngstown Sheet & Tube...

KOPPERS designed and



engineered 8 new open hearths

A SIGNIFICANT PHASE of the recent expansion of steel-producing capacity by The Youngstown Sheet & Tube Company was the addition of a new open-hearth shop at its Indiana Harbor plant.

This open-hearth shop, with eight furnaces, was designed and engineered by the steel plant specialists of Koppers Freyn Department, who also engineered the installation of a complete slabbing mill at this plant during the same expansion program.

Design of the main open-hearth furnace building would permit the eventual addition of four more furnaces, if needed.

Shop layout includes a hot metal transfer station, utilizing 150-ton mixer-type ladles and 100-ton transfer ladles, located in a 216 by 85 ft. area at one end of the building.

The charging aisle proper extends for an additional 1,080 ft. The furnaces are spaced at intervals of 108 ft. and an additional 54-ft. bay is provided at the center of the shop.

The furnace design is of interest in that in addition to end chill boxes, additional hearth cooling space is provided throughout the length of the furnace.

Each of the furnaces in the efficient new shop is rated at 225 tons of ingots per heat, but is regularly averaging more than 275 tons. Rated annual ingot-producing capacity for the eight furnaces is in excess of 1,600,000 net tons.

Designing and constructing open hearths is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.



*Engineering and
Construction Division*

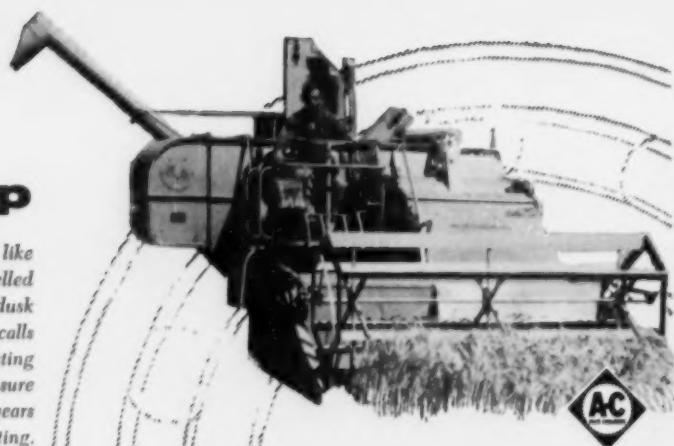
FREYN DEPARTMENT

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA

◀ Pouring aisle, one of the widest in the world, at Youngstown Sheet & Tube's new open-hearth shop.

to bring in a crop

You don't baby a work-horse like this Allis-Chalmers self-propelled All-Crop Harvester. Dawn-to-dusk harvesting is rugged work—and calls for ruggedness in every rotating part. Federal Ball Bearings insure trouble-free operation and years of good harvesting.



...or run off a copy

When big plans are afoot, Charles Bruning's king-size Copyflex is on the go all day. Engineering drawings and tracings are reproduced with high precision in a continuous conveying operation. Many feed rollers are used—Federal Ball Bearings keep 'em turning.



so much of industry turns on FEDERAL ball bearings

Machines that take the sweat out of harvesting... the error out of copying... the bugs out of manufacturing. Machines everywhere—in your home... your office—functioning smoothly and effortlessly, thanks to Federal Ball Bearings. 12,000 sizes to solve your anti-friction problems. Hundreds of types. Produced by a 50-year-old manufacturer of ball bearings exclusively.

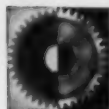
When Federal Ball Bearings are part of so many things you use, shouldn't they be part of the things you make?

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.

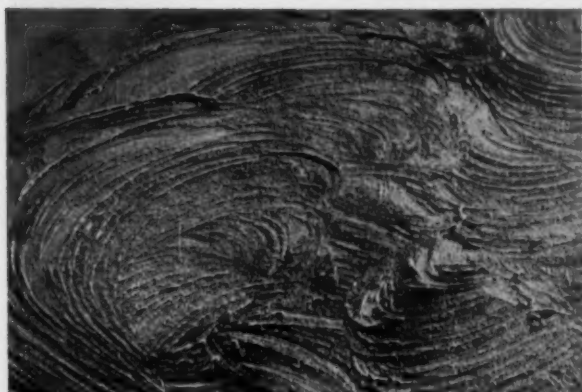
New! Ball bearing and engineering data! 175 pages full in
FEDERAL'S NEW CATALOG! To get your copy, just drop us a line.

Federal Ball Bearings One of America's Largest Ball Bearing Manufacturers





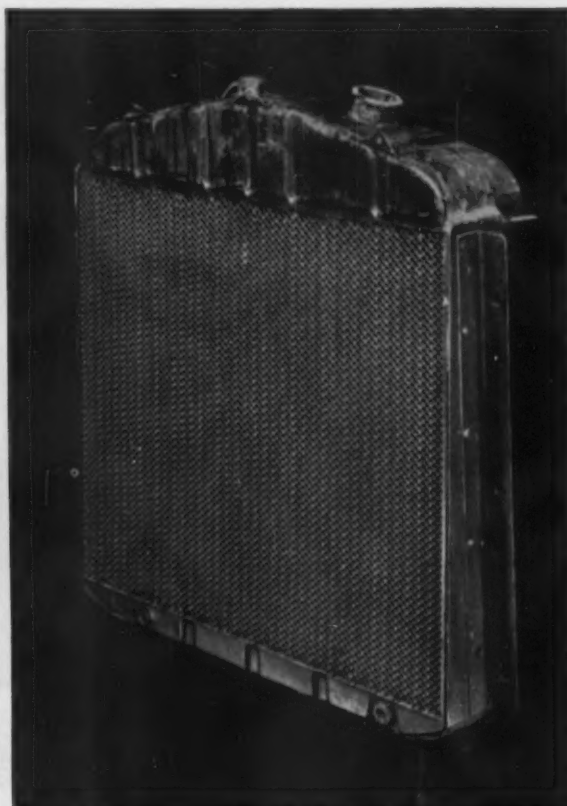
DOW ... industry's most complete line of chlorinated solvents



Heavy buffing compound residue is generally tough to remove . . .



but comes off quickly and economically with vapor degreasing . . .



leaving parts clean, bare, dry, ready for next operation.

when parts are heavily contaminated • when they're thin-gauge metal

DOW PERCHLOROETHYLENE

CHECK THESE VAPOR-DEGREASING ADVANTAGES

- Better solvent action on contaminants
- Safer—nonflammable
- Lower solvent losses
- Better removal of moisture from work
- Better stability with light metals

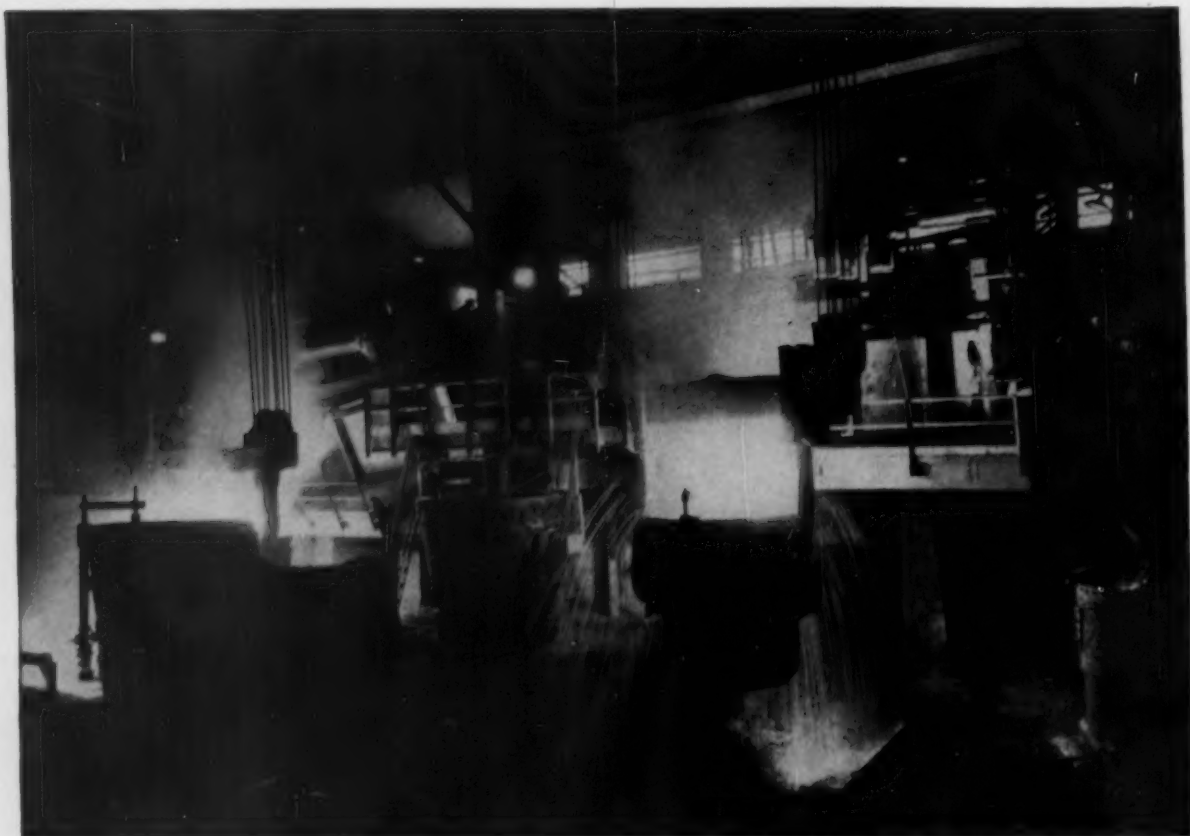
You can make tough, trouble-making runs *faster* . . . get *fewer rejects* . . . operate at *greater over-all economy*. The answer? DOW PERCHLOROETHYLENE. Why? This stabilized solvent's higher boiling point gives longer, more thorough cleaning action before temperature of the parts reaches that of the solvent. Buffing compounds and heavy greases roll off. Thin-gauge parts don't require second or third reruns.

Contact your Dow distributor today for a supply of superior DOW PERCHLOROETHYLENE. He's the source for your *other* specialized solvent needs, too . . . stabilized DOW TRICHLOROETHYLENE and CHLOROTHENE*, the versatile new *cold* degreaser. For detailed information on any one or all of these chlorinated solvents, simply send a post card to THE DOW CHEMICAL COMPANY, Dept. S671C, Midland, Michigan.

*TRADEMARK

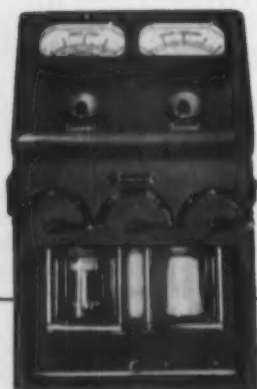
you can depend on DOW SOLVENTS





Crucible Steel, Midland, Pennsylvania

"Cities Service Heat Prover helps make special steel, saves fuel"



THE CITIES SERVICE HEAT PROVER...

Not an instrument that you buy...
but a service we supply!

FREE!

Crucible Steel Company of America is another leading steel company that has found the Cities Service Heat Prover a valuable aid in its furnace operation.

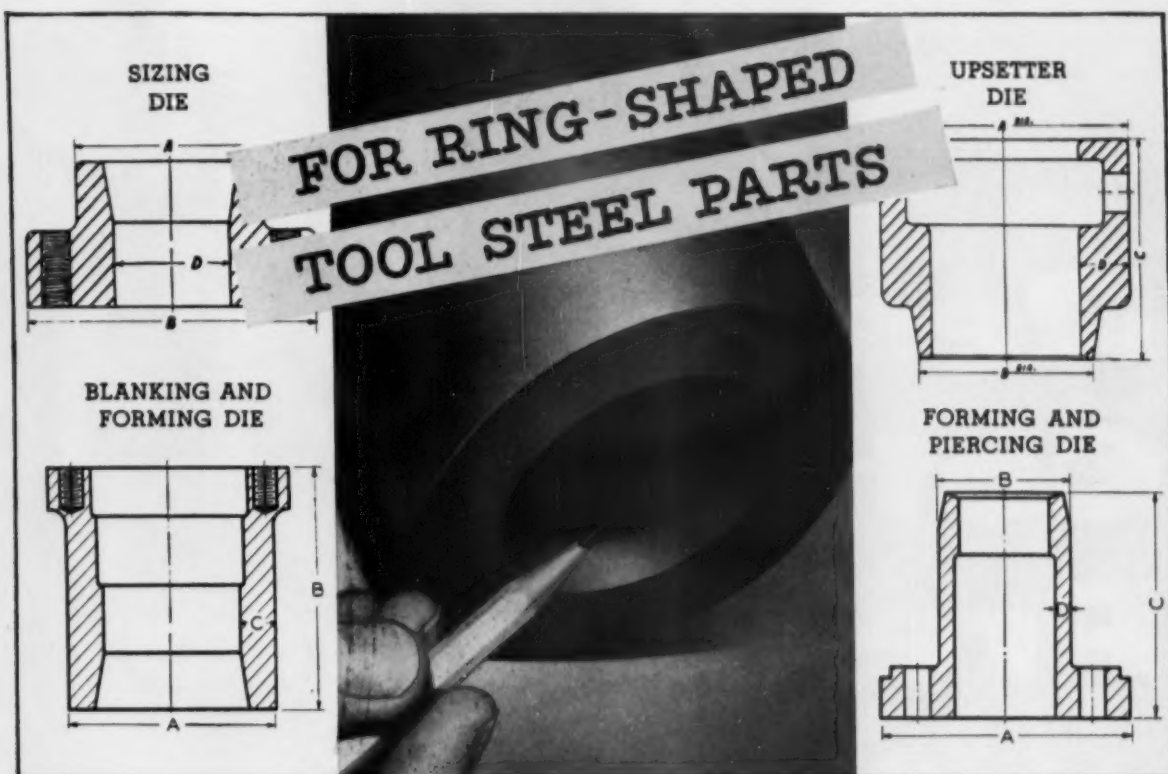
Here's what Crucible has to say about the Heat Prover at its Midland Works, one of several where it is in constant use.

"The Heat Prover has become our standard tool for the setting up and checking of combustion controls on our many furnaces at Midland. It has also helped immensely in setting up special atmospheres for special grades of steel by providing fast and reliable analyses, and has been particularly instrumental in the improvement of fuel economy. Cities Service has kept the Heat Provers in perfect running order and on many occasions has gone out of its way to help us."

You, like Crucible Steel, can achieve better results in *your* furnace operation with the Cities Service Heat Prover. Supplied and maintained free by Cities Service, it offers easy portability, rapid continuous sampling, simultaneous reading of oxygen and combustibles. For more information, talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



New Graph-Mo Hollow-Bar eliminates drilling, machines 30% faster

MAKERS of ring-shaped tool steel parts who use Graph-Mo Hollow-Bar will tell you it speeds up production, cuts down waste, and saves steel. That's because the hole is already in it. There's no drilling, you start with finish boring.

What's more, you get all the proved advantages of Graph-Mo that have made it one of the most popular tool steels—excellent machinability, wearability, and stability.

Graph-Mo machines 30% faster than other tool steels and has a minimum tendency to scuff or gall. The combination of free-graphite and diamond-hard carbides in its structure gives it exceptional wearability. Users report that Graph-Mo outwears other tool steels on an average of 3 to 1.

Graph-Mo also is the most stable tool steel ever made. For instance, a Graph-Mo steel master plug gage showed less than 10 millionths of an inch in dimensional change after 12 years of use. And Graph-Mo responds uniformly to heat treatment, too.

If you make ring-shaped tool steel parts, make sure you get all the advantages of Graph-Mo Hollow-Bar. Sizes range up to 16" O.D. with a variety of wall thicknesses. It's made by the specialists in fine alloy steels, The Timken Company.

Graph-Mo Hollow-Bar is distributed through A. Milne and Co. and the Peninsular Steel Co. warehouses.

To find out more about this tool steel, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

September 22, 1955

Research-Cottrell Precipitator

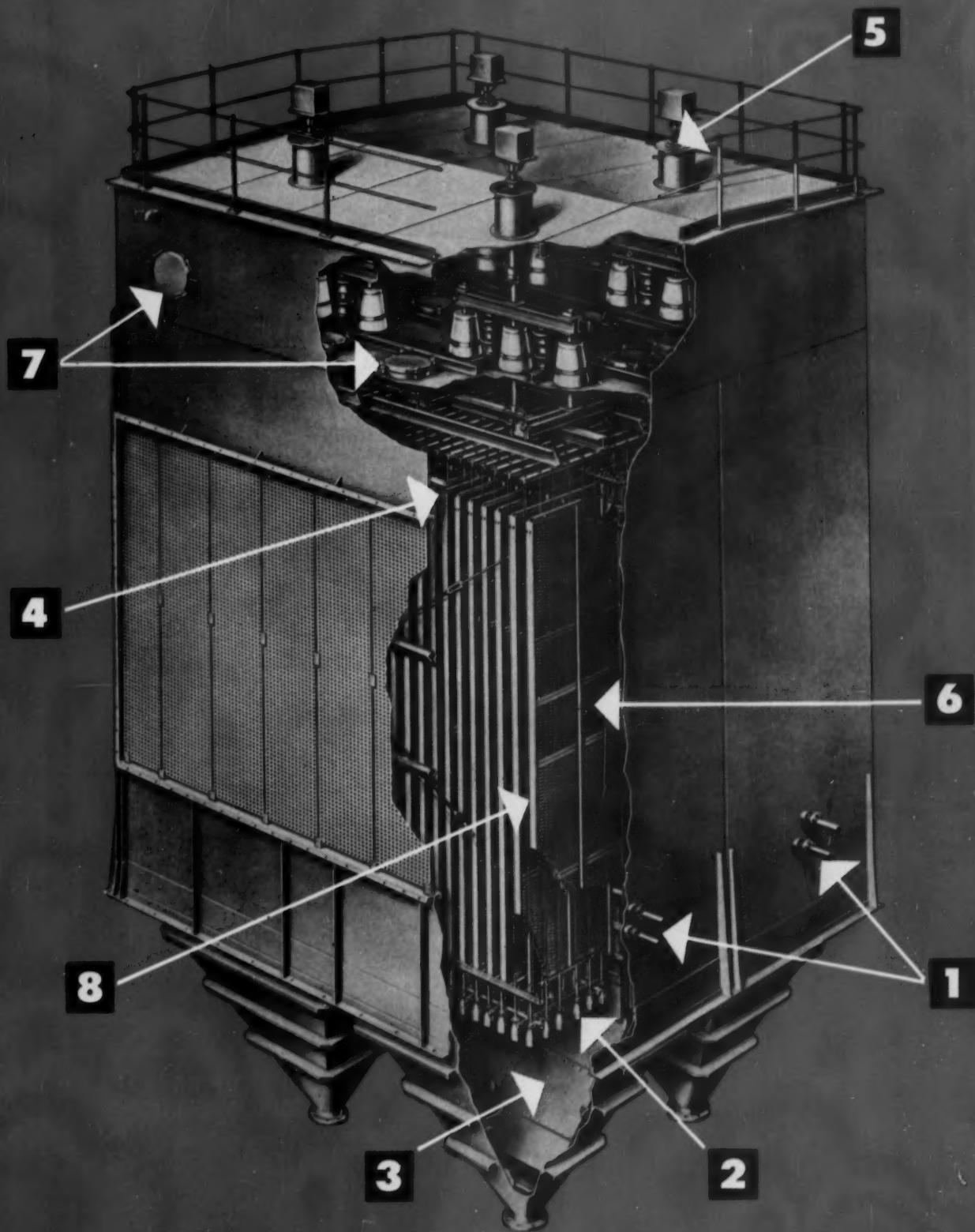
- Open Hearths
- Iron Ore Sintering Machines
- Ferro-Manganese Blast Furnaces
- Scarfing Machines

Take a look inside the horizontal flow precipitator on the next page. This is the type of Cottrell used for cleaning gases coming from open hearths, iron ore sintering machines, ferro-manganese blast furnaces, as well as scarfing machines and electric furnaces.

Although it differs in design from the Research-Cottrell blast furnace precipitator, this Cottrell has the same basic advantages—handles any volume of gas at any collection efficiency up to almost 100%. Maintenance and power costs are low, draft loss is only a few tenths of an inch of water, and the precipitator is designed and constructed for many years of heavy-duty, all-weather service.

In addition to these major advantages, a few more design features are shown in the cutaway drawing on the next page.

- 1** Rapping puffs prevented by automatic and continuous cleaning of collecting electrodes with Magnetic Impulse Rapper (patents pending).
- 2** Plumb-bob discharge electrodes are individually weighted and positioned by a steadying frame for maximum efficiency.
- 3** Hopper baffle prevents gas leakage around electrodes.
- 4** Hook-type collecting electrode hangers, quickly installed, insure uniform distribution of rapper vibration throughout entire collecting surface.
- 5** Continuous, automatic discharge electrode rapping insures optimum performance.
- 6** No moving parts in gas stream—minimizes maintenance.
- 7** Easy access to high tension equipment.
- 8** End and intermediate baffles provide quiescent zones and prevent re-entrainment of collected dust.



Research-Cottrell, Inc.

A Wholly Owned Subsidiary of Research Corporation

Main Office and Plant: Bound Brook, N. J. • 405 Lexington Ave., New York 17, N. Y. • Grant Building, Pittsburgh 19, Pa.

228 N. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

**NO. 4 (M-2240) AND
NO. 5 (M-2250) RAM TYPE
TURRET LATHES**
ALL-CLUTCH AUTOMATIC
SHIFTING HEAD



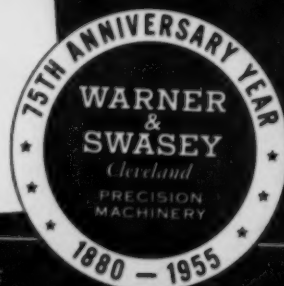
NO. 4 (M-2240)
2" Bar Capacity
18 1/2" Swing
NO. 5 (M-2250)
2 1/2" Bar Capacity
20" Swing

**RAM TYPE
TURRET LATHES**



NO. 2 ALL-GEARED HEAD
1" Bar Capacity
14" Swing
NO. 3 UNIVERSAL
1 1/2" Bar Capacity
15 1/2" Swing
NO. 4 UNIVERSAL
2" Bar Capacity
18 1/2" Swing
NO. 5 UNIVERSAL
2 1/2" Bar Capacity
20" Swing

**THERE is a proper size and type Warner
& Swasey machine to fill your turning needs, for
it has always been a cornerstone of Warner &
Swasey policy to build an individual model for
each type of work.**

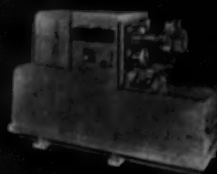


**SADDLE TYPE
TURRET LATHES**
HEAVY DUTY



1-A UNIVERSAL
2 1/2" or 3" Bar Capacity
16 1/2" Swing
2-A UNIVERSAL
3 1/2" Bar Capacity
20" Swing
3-A UNIVERSAL
4 1/2" or 6" Bar Capacity
23 1/2" Swing
4-A UNIVERSAL
8", 9" or 12" Bar Capacity
28 1/2" Swing

**SINGLE SPINDLE
AUTOMATICS**



1 AC CHUCKING MACHINE
8" or 10" Chuck —
6" Working Stroke
2 AC CHUCKING MACHINE
10" or 12" Chuck —
9" Working Stroke

SADDLE TYPE TURRET LATHES
EXTRA-HEAVY DUTY



1-A UNIVERSAL
2 1/2" or 3" Bar Capacity
16 1/2" Swing
2-A UNIVERSAL
3 1/2" or 4 1/2" Bar Capacity
20" Swing
3-A UNIVERSAL
4 1/2" or 6" Bar Capacity
23 1/2" Swing
4-A UNIVERSAL
9" or 12" Bar Capacity
28 1/2" Swing

MULTI-SPINDLE AUTOMATICS



6 SPINDLE BAR MACHINE
1/2" or 1 1/2" Bar Capacity
5-SPINDLE
CHUCKING MACHINE
6" Swing
5-SPINDLE BAR MACHINE
1 1/2" Standard Bar Capacity
2 1/2" Oversize Capacity

ELECTRO-CYCLES®



NO. 1 ELECTRO-CYCLE
1/2" Bar Capacity
11" Swing
NO. 2 ELECTRO-CYCLE
1" Bar Capacity
14" Swing
NO. 3 ELECTRO-CYCLE
1 1/2" Bar Capacity
15 1/2" Swing
16" ELECTRO-CYCLE
1 1/2" Bar Capacity
16 1/2" Swing

**PRECISION TAPPING AND
THREADING MACHINES**



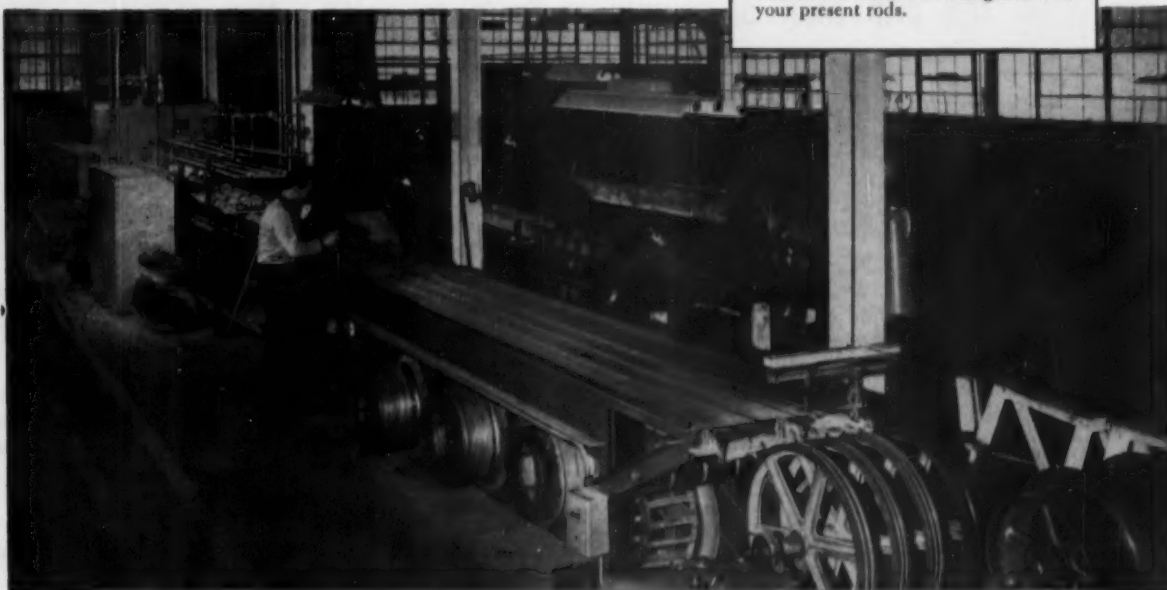
NO. 10 TAPPING MACHINE
0.40 to 10.24 Capacity
NO. 11 RS RADIAL
(Single Head)
NO. 11 RD RADIAL
(Double Head) 8.36 to 1/2" Capacity
NO. 11 TAPPING MACHINE
8.36 to 1/2" Capacity
NO. 12 TAPPING MACHINE
1/2" to 2 1/2" Capacity

Reg. U. S. Pat. Off.

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

Why another plant converted to "HOT RODS" 100%

***J. Bishop & Company Platinum Works reports
CRYSTOLON* heating elements outlast others
by 3-to-1 in Drever furnaces***



One of the Three Drever Electric Furnaces at the Frazer, Pa., tube mill of J. Bishop & Company Platinum Works, specialists in small diameter stainless steel tubing (.008" to 1" O.D.), tubular fabricated parts, surgical instruments and refiners of precious metals.

Wherever it uses silicon carbide heating elements — as in its Drever electric furnaces — J. Bishop & Company has changed over completely to "Hot Rods."

The reason: other elements lasted only 6 months — "Hot Rods" averaged 18 months' service life!

More and more, this 3-to-1 longer life of Norton CRYSTOLON elements is becoming recognized for the truly sensational performance that it is — and a constantly growing number of economy-minded electric furnace operators are taking advantage of it.

But there's a good deal more to this

benefit-story. The longer life of "Hot Rods" means you save on element costs — because you use less of them. Also, fewer changes of elements and voltage taps mean greatly reduced maintenance, and a much smoother production flow.

Get Further Facts

on how "Hot Rods" can improve and economize your own electric furnace or kiln operations. Send for the big illustrated booklet, "Norton Heating Elements." NORTON COMPANY, Refractories Division, 208 New Bond Street, Worcester 6, Mass.



CRYSTOLON Heating Elements, or "Hot Rods", are a typical Norton R — an expertly engineered refractory prescription for greater efficiency and economy in electric furnace and kiln operation. Made of self-bonded silicon carbide, each rod has a central hot zone and cold ends. Aluminum-sprayed tips and metal-impregnated ends minimize resistance and power loss. Available in standard sizes and interchangeable with your present rods.

NORTON
REFRACTORIES

Engineered... R... Prescribed

***Making better products...
to make your products better***

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

A SPECIAL REPORT ON PROTECTIVE FINISHES FOR ALUMINUM

Most aluminum producers and fabricators are well aware of the superiority of chemical finishes over anodizing for the protection of aluminum from corrosion. Naturally, then, there is a running battle for acceptance among the leading producers of the protective chemical finishes.

That's why, here at Allied, we have always studied your needs with regard to both our own and competitive processes. We're constantly trying to produce new and better finishes because we believe there's always room for improvement . . . even to our own products. Some years ago this policy led to the introduction of a process, long in development, that offered you a way to overcome anodizing's obvious technical complications . . . Iridite #14. This finish was far easier to use than anodizing, yet provided comparable, if not superior, quality. And, its cost was much less than anodizing.

But other finishes offering similar advantages over anodizing have entered the market. So . . . the current battle for acceptance. By any cost comparison Iridite #14 is the most economical. However, corrosion tests by users show contradictory results as to performance from Iridite #14 and other leading protective finishes for aluminum. Most tests show Iridite #14 superior, but some do not. The margin of difference, however, is always small. The truth is that all have proved good. However, our laboratory research indicated that still further improvements could be made.

That knowledge . . . plus our aim to give you even better protection and maintain the leadership of the industry, is exactly why Allied Development Engineers have been working for long years to develop a better finish than any of those now available, including our own Iridite #14.

Now the new finish is ready for you. It's called Iridite #14-2 (Al-Coat).

From a performance standpoint, Iridite #14-2 gives you two important advantages in the protective finishing of aluminum.

FIRST: in its fully colored brown film stage it provides corrosion resistance decidedly superior to previous processes.

SECOND: the basic brown film can be hot water bleached to produce a clear-type film with protection heretofore unobtainable from clear-type chemical finishes.

From an operating standpoint, new Iridite #14-2 gives you three important advantages.

FIRST: it provides consistently

higher corrosion resistance for different aluminum alloys treated in the same bath.

SECOND: it provides a more uniform appearance for parts of different alloys and with varied surface finishes before treatment.

THIRD: its operating and technical characteristics are superior to those of other processes.

If you are using or planning to use a chemical finish for aluminum, you should have full details on new Iridite #14-2. Write us or send samples for free test processing. Or, for more immediate advice, call your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book. . . . ALLIED RESEARCH PRODUCTS, INC., 4004-06 EAST MONUMENT STREET, BALTIMORE 5, MARYLAND.

P. S. Even new Iridite #14-2 will be constantly measured against both your needs and competitive processes to make sure you get the best possible, most economical finish for your product that man and the laboratory can develop.

Judge for yourself the advantages of
VANCORAM FERROVANADIUM
 packed in bags



Look for the blue product marking which is the identifying color for Vanadium in Vancoram's original color coding system.

Each of these bags contains 25 lbs. of vanadium for handy cost-saving additions to furnace, cupola or ladle.

SAVES TIME AND MONEY—You don't have to weigh prior to alloy addition. Each bag contains exactly 25 lbs. of vanadium. Thus you save on handling costs.

CONTAMINATION AND WASTE ELIMINATED—The ferrovanadium is confined to its own bag . . . made of strong, white, cotton fabric with a crepe-paper interlining that's adhered to the outer covering with a special moisture-resisting adhesive. Bags eliminate waste common to other types of packing.

INVENTORY AND HANDLING PROBLEMS SIMPLIFIED—Standard weight of each bag means quicker inventory. Palletized shipments can be handled quickly and easily by fork truck or crane. Each bag is clearly labeled for ready identification.

UNIFORMLY HIGH-GRADE MATERIAL—Vancoram ferrovanadium is produced under strictest quality control and thus is guaranteed to be physically clean and of uniform high quality.

Bagged ferrovanadium is another example of the way VCA works to help steelmakers make better metals faster—and at lower cost. Contact your VANADIUM CORPORATION representative for further information on Vancoram ferro alloys.



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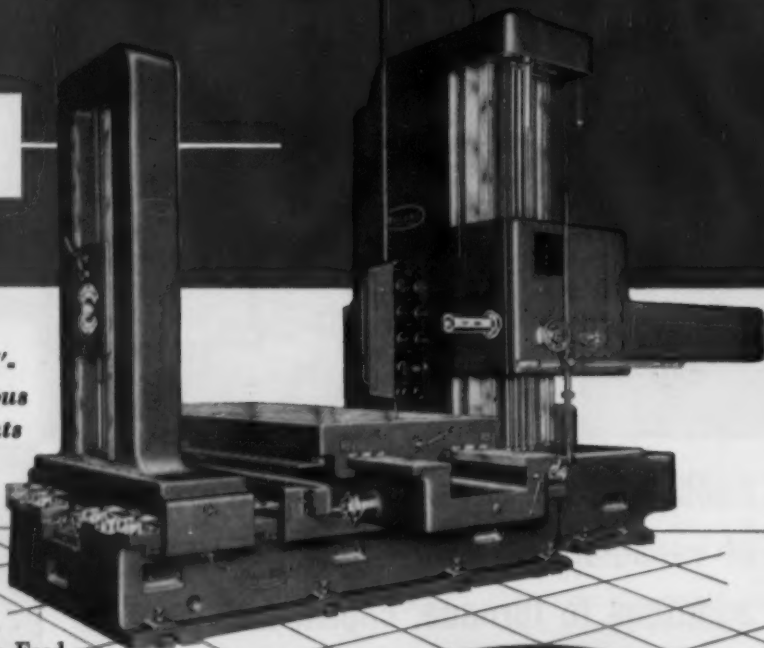


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Sentries of Quality

Weirton mills are blanketed with "sentry stations." From these outposts, the quality and uniformity of Weirton steel is guarded and guided by constant control.

From stations located throughout the mills, samples of materials are periodically carried to the Quality Control Laboratory by special pneumatic tubes. Here, complex analysis, checks and tests are made simultaneously by chemists, metallurgists and engineers, who use the most up-to-date equipment. Based on their findings, directions are flashed by telautograph and two-way radio to the men on the job.

This network of fast-acting controls is one more way Weirton maintains strict high quality and uniformity of its cold-rolled strip steel, along with the many other types of steel it makes. It is one more important reason why you should call Weirton the next time your plans call for cold-rolled strip steel.



WEIRTON STEEL COMPANY

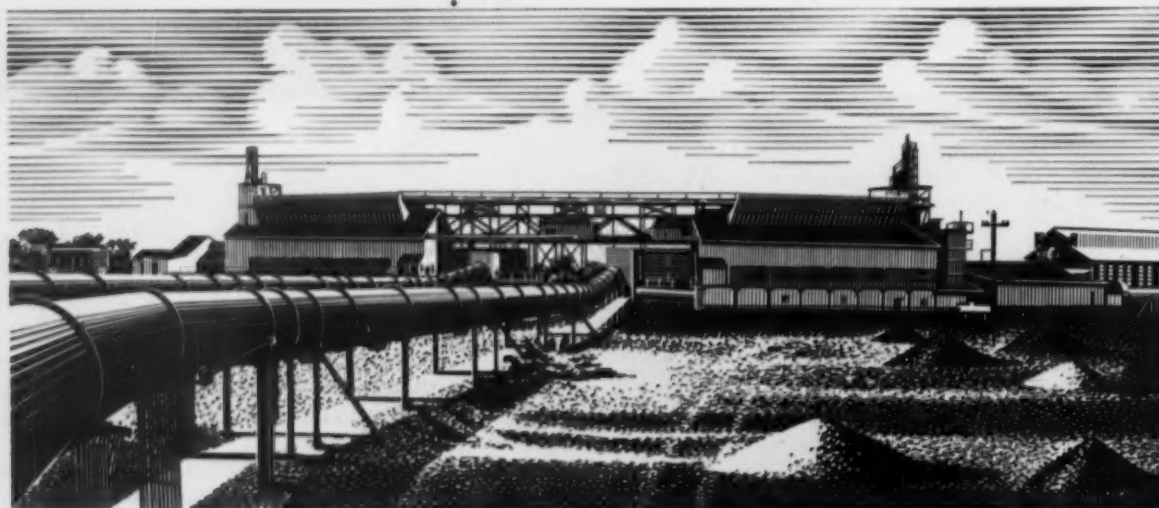
Weirton, West Virginia

NATIONAL STEEL CORPORATION



American
Zinc and its products

from **A**
to **Z**



**DUAL OPERATION AT
HILLSBORO, ILLINOIS**

(1) The Oxide Division supplies American process lead-free and leaded zinc oxide, as well as French process zinc oxide. (2) In the Metal Division, Prime Western, Select, Brass Special, Intermediate and High Grade slab zinc are produced. For complete picture of American Zinc operations, see map above.

PRODUCERS OF

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METALLIC CADMIUM
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Zinc sales
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A leading machine tool builder recently put a trained engineer on the road to make periodical inspections of equipment in customers' plants. The idea behind the move is to spot impending troubles and order replacement parts immediately, thus reducing maintenance downtime later. The plan is not only an excellent goodwill builder, but the orders on replacement parts more than pay for the service.

Coal is taking the lion's share of increased fuel demands by a rapidly expanding electric utility industry. So far this year, electric production is running 15 to 20 pct above that for the same period last year. Moreover, increased generation of power by fuels is outstripping hydro-power growth. In the first five months of '55, on a coal-ton-equivalent basis, utilities used 9,341,000 additional tons of fuel of which almost 90 pct was coal.

Some local governments have laws which place a tax on inventory. In the tight squeeze for steel and other metals, some small businessmen were unable to lay in supplies when it was easy to do so. Reason: High tax on inventory. This penalizes farsightedness.

Aluminum and even plastics may soon enter the pressurized container market which is now consuming more than 200 million containers annually. At present, tinplate heads the list of materials used for popular-size cans, requiring 4.4 million base boxes of tinplate annually—or 2.5 boxes per 1000 cans. Optimists in the industry are looking for a one-billion container annual output within a few years.

A portable molten metal thermocouple pyrometer for foundries and melt shops quickly determines

Fewer Job Titles

Automaker Looks For Diversity

One of the independent automakers is currently negotiating with the government to manufacture components for the J-57 jet engine now being produced by Ford in Chicago. It is hoped that the job will give the firm financial assistance and diversify its activity.

Aluminum oxide is being extruded in triangular-shaped segments for use in tumbling operations. The angularly-shaped pieces do not tend to wedge in holes and slots in workpieces being tumbled. The result is more uniform tumbling action and better surface finishing on parts.

High production levels of cars, appliances and other durable goods have pushed consumption of zinc for diecastings to a new high rate. Production of diecastings, based on figures for the first seven months of this year, should place the annual output at about 375,000 tons, a jump of close to 90,000 tons over last year and 140,000 tons over that of three years ago.



**New Selas automatic heat processing method increases production rate 4½ times
... decreases fuel consumption 20% ... improves plant efficiency**

Reduction of a conventional 20 to 30 hour heating cycle to less than four hours ... with a corresponding increase in production rate ... has been achieved through use of a Selas Gradation furnace at the Heppenstall Company, Pittsburgh, where alloy steel die blocks, 8" to 24" thick, are heated to 1550°F. for hardening.

The completely automatic program-control heating method achieves reproducible uniformity in die block quality and assures that fast heating of large steel sections is practical and safe.

- The precision timing of the heating cycle permits close scheduling of quenching facilities and manpower, resulting in higher overall plant efficiency.
- Less labor (only about 20 minutes per heat) and less

highly skilled operators are needed ... to produce uniform results within each heat, and from heat to heat.

- Fuel consumption, per pound of steel heated, is reduced 20%.

The Selas gas-fired furnace, factory prefabricated, was in operation one week after delivery, eliminating six weeks of interruptions to plant operations customary with plant-site erection of other furnaces.

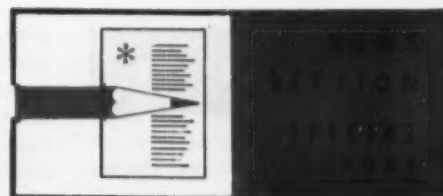
The benefits of Selas Gradation heating apply to small as well as large metal sections and include heat treating, brazing, forging, strip heating and many other continuous operations.

Write for descriptive data on Selas heat processing methods. Informative article describing the Heppenstall die block heating installation also available.



SELAS

**CORPORATION OF AMERICA
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How 1956 Politics Will Affect You

Watch out for anti-business sentiment as election campaigns get underway . . . "Big Business" will be a hot issue . . . Investigations will come thick and fast . . . Antitrust strategy—By N. R. Regeimbal.

♦ **FOR THE** next 12 months, politics and campaigns leading up to the 1956 national elections are going to dominate the country. Businessmen are going to find themselves caught in the no-man's-land of the political battlefield.

Antibusiness sentiment is going to sprout and blossom at every crossroads, flourishing particularly in Washington. Many businessmen with skin softer than leather are going to get mad (some already are).

Here's the reason: Democrats hold a paper-thin margin in Congress, so they can't let down local efforts to concentrate on the White House race. But the Republicans, apparently pretty safe in the White House if Ike decides to run again, will have an uphill battle to regain control of Capitol Hill for their chief.

Get Set For Critics

Democrats are virtually without issues, while the Republicans are reminding the "little guy" that he never had it so good. In retaliation, the Democrats have about abandoned investigations of Communism and security and have a dozen probes in mind which they hope will give them material to depict the GOP as the "big business" party.

But they can't make the charge stick without showing a relationship between men, companies, and government. A lot of innocent businessmen are going to find themselves attempting a defense against insinuations, innuendo and wild charges as a result.

Businessmen are more than ever going to have to get used to the idea of doing business in a fishbowl, not only as far as their dealings with the government and politics are concerned, but also in their pricing and competitive policies. "Monopoly: Republicans foster it" is going to be one of the major campaign saws in the coming campaign.

Among the investigations which will be used as a springboard to the antibusiness-in-government theme will be a "study" of the

entire General Motors corporate set-up, practices, policies and power next month by a Senate Judiciary antitrust subcommittee headed by Sen. Harley S. Kilgore, D., W. Va. Expect plenty of references to GM's size and dominance of the auto and particularly the bus markets, and the number of alumni it has sent to Washington, including Defense Secretary Wilson.

His "what's good for General Motors is good for the country" and his famous, if misunderstood,

How 1956 Politics Will Affect Business

■ **Antibusiness sentiment will increase as Democrats try to pin Big Business label on Republicans. Anything that can be construed as a misdeed by a WOC or a business-government contract or other relationship will be dynamite. More than ever before, business must get used to the idea of doing business in a goldfish bowl.**

■ **Some big businesses — GM, U. S. Steel, Dupont maybe—may be dragged in to Washington and put through the wringer by the Democrat-controlled Congress.**

■ **Nothing will be done by Congress to hurt the business boom. And the Republican administration will also make sure there are no high or low spots. Some specific examples—**

■ **Taxes—Tax cuts will favor the little guy (voter) first, then ex-**

cises which the voter also sees directly in many cases. Business taxes, which don't show up at retail quickly, probably no cut.

■ **Antitrust—Antitrust prosecutions by Justice and FTC will be more active, agencies will brag about it more. Barnes will probably set the pace and sound the Administration policy.**

■ **Labor legislation — A good chance more Taft-Hartley amendments favored by unions will go through (weren't introduced this year, probably saving them for election year), but little chance that business will get much from Taft-Hartley or minimum wage amendments.**

■ **Spending—Won't be cut much and socialized type programs won't be cut. A good time for liberalizing Social Security benefits. Reps will court little guy, who "never had it so good."**

SPECIAL REPORT

crack about bird dogs, will be on front pages again.

Other investigations will center on the Wall Street financial operations, the Dixon-Yates contract, power utilities, farm prices, Air Force contractor profits, businessmen serving as government advisors without compensation (WOCs), and in fields not yet dreamed up.

Republicans are showing some fear of the big business label, so they won't go overboard in protecting businessmen brought under Democratic fire.

Despite all the smoke to be generated around the business community, Democrats as well as Republicans are going to be mighty careful not to take any actions to slow the booming business pace. Neither party can afford to be tagged in any way with causing wages to go down or taxes to go up.

Individual Tax Cuts

What effect will campaign fever have on legislation next year? Briefly, here's how most observers size up the coming Congressional year:

TAXES—Major order of business after Congress convenes in January will be to cut taxes. President Eisenhower is expected to recommend a tax cut, and the Democrats are expected to respond with a proposal for a bigger reduction. Both plans, however, will be aimed at paring the levy on individuals.

In the fight to see who gets credit for the reduction, the final result could be a cut larger than either party particularly wants, although President Eisenhower is given some chance of getting his bill through. If he does, the Republicans will claim credit for the cut, and the Democrats will shout loud and long how they would have done better.

If Eisenhower's plan contemplates permitting excise tax cuts scheduled on April 1 to go

through, Democrats will charge that the Republicans want to hold down relief to the little guy—alias the voter—in order to help out their big business friends. The corporation tax rate is scheduled to drop from 52 pct to 47 pct with the excise tax cuts, but the most business can hope for is a cut to 50 pct, and that's doubtful.

No Serious Cuts in Defense

NATIONAL SALES TAX—As revenues shrink because of the tax cuts, and more and more excises are dropped from high wartime rates, to 10 and 5 pct, a perennial proposal to establish a national 5 pct sales tax will gain supporters.

Hearings on the proposal begin next month and run through December, off and on, and most of the controversy is going to center around whether it should be applied at the manufacturing level (where it is hidden) or at the retail level.

DEFENSE SPENDING—Economy moves in the Eisenhower Administration won't trim much of the \$34 billion a year rate of defense spending. Total ordering of military goods won't drop, although some civilian type goods may be cut off and the military will tend to be a little sharper in negotiating contracts.

In the fiscal year beginning next July 1, military expenditures will again be set around \$34 billion. Politics will tend to keep them at least at that level, and the Democrats, to try to make stick a charge that the Administration is cutting back defense readiness too much, may even force the total up.

Big Labor Hubbub

Defense planners removed from politics are convinced that \$34 billion is about a minimum yearly outlay in the cold war, and if prices of basic materials go up, and weapons become more complex and therefore more expensive, the tendency will be for increases over the years ahead.

LABOR—An election year is



WHETHER Ike runs or not, 1956 election politics will affect business. There's bound to be some anti-business maneuvering.

always a good time for labor legislation supported by unions. Taft-Hartley Act amendments will probably be introduced again next year. No changes were debated this year, which indicated that the politicians wanted to wait until an election year, and that union leaders agreed to the strategy.

Of the 14 amendments to Taft-Hartley proposed two years ago, it is doubtful that serious fights will be permitted to develop over those sought by business — too risky in a year where the Administration is trying to avoid the big business label. But there is a good chance that the union-backed proposals will get through.

Antitrust Strategy

Further amendments in the minimum wage law are also expected to crop up, and find legislators generally receptive. Drive in 1956 will be to include some workers in interstate retail business and remove exemptions in warehouse and service trades.

ANTITRUST—Antitrust activities of the Justice Dept. and the Federal Trade Commission will tend to rise under Congressional fire in the months before the election. And the two agencies will aim for sensational cases, brag about results more—to try to offset criticism. Chances are both agencies will come out with more general statements about this or

that industry stepping on the antitrust fringe, without filing any cases.

Look for Assistant Attorney General Stanley S. Barnes, who heads up the antitrust division, to become the spokesman on Administration antitrust philosophy.

SOCIAL SECURITY — President Eisenhower is expected to lead the fight for further "liberalization" of the social security law. Amendments left pending at the last session of Congress would have brought self-employed professionals into the system; materially increased already scheduled hikes in Social Security taxes; reduced retirement age for widows, and increased benefits to dependents. The Administration opposed details of the 1955 bill, but is ready to go along with the principle of expanding social security in an election year.

The Pollution Issue

PUBLIC WORKS — Of the 32 Senate seats at the polls next year, 15 were won last time by less than 5 pct—10 now held by Republicans and 5 held by the Democrats. Another half-dozen seats are also considered perilous, although won last time by larger

margins. Both national committees will pour funds and spokesmen into those states, and the incumbents will try to get party backing for large expenditures in their home areas to help bolster their chances of re-election.

As a result, don't be surprised if a host of public works projects make their way through the Congress.

POLLUTION—Part of the anti-business drive next year will probably also bring down on the heads of many a hapless industry charges growing out of air pollution, smog and water-pollution, and the like.

As these charges are made, hearty appropriations for correcting pollution conditions, plus some stricter anti-pollution laws may come rolling out of Washington.

Highway Program Hot Issue

Highways — President Eisenhower, the truckers, the road-builders and their suppliers, insurance firms, and most importantly the public (voters again) want new, wider, less dangerous roads. Failure of Congress last year to come up with any long-range highway building program surprised lots of the interested parties.

If politics killed the road program this year as often charged, politics will put it across next year. The President is determined to get a program out of the lawmakers, and most lawmakers are just as anxious to oblige—with plenty for my district please. As a result, firms who figure to be involved in what will probably be the country's biggest road building orgy, can feel pretty sure that orders will start coming in after the next session of Congress.

As a national election year rolls around again, businessmen should keep a weather eye on state legislatures and even local and municipal governments. National campaign heat had a lot of radiation effects. In most areas many of the same harassments and benefits coming out of Washington in an election year are backed up by the same activities locally.

Survival:

U. S. to work with cities on evacuation plans.

Municipal officials, with federal financial and technical help, are going to draft new survival plans to clear residents from major target zones when attack threatens.

A \$10-million congressional appropriation backs the new program.

Teams of technicians sent out by Federal Civil Defense Administration are to work closely with local authorities in preparing the survival schemes. One of the first cities listed for assistance by the agency is New York, with Milwaukee, St. Louis, and Philadelphia to follow. A project for Chicago probably will be started in a few months.

Get Out of Town

Plans are to be completed and tested in each area within a year after the work starts, unless civil defense officials grant more time for areas encountering complex problems.

In general, the policy will be to move residents beyond the "urban fringe," as FCDA designates the area where population drops to 2,000 persons per square mile.

Where Congressional Fights Are Tight

■ States where congressional races are tight will see a lot of hot campaign oratory plus healthy slices of election spending as the Democrats attempt to protect or even widen their narrow control of Congress and make the big jump to the White House, and Republicans attempt to win back Congress for Ike.

■ In addition, a lot of special projects, particularly public works, will tend to filter to these "marginal states." Both businessmen and labor leaders in the close areas who think they can deliver votes will be courted.

■ Here are the states in which National party leaders believe the closest fights will develop: California, Colorado, Connecticut, Illinois, Indiana, Maryland, Ohio, Pennsylvania, Utah, Wisconsin, Idaho, Kentucky, Missouri, New York, Oklahoma, Washington, and Oregon.

FOIL: Wraps Up Bigger Market

Consumers like aluminum wrapped goods . . . Practical advantages take second place to looks . . . Producers plan more expansion of foil facilities . . . 1955 market shows big gain—By F. J. Starin.

♦ AFTER 20 YEARS of slow and steady gains in the field of packaging, aluminum foil has taken over a dominant position in the business of wrapping up consumers goods of all kinds.

Key to the tremendous increase in demand for aluminum foil packaging is the consumer, who has taken to the metal wrapping for its appearance, paying only secondary attention to the practical advantages of foil wrapping.

Foil is a natural packaging material for its properties that make it (1) impervious to gas, (2) greaseproof, (3) non-absorbent, (4) shrinkproof, (5) substantially sterile, (6) corrosion resistant and (7) strong.

Shipments Increase

Here's an example of consumer approval of foil packaging:

A tentative decision was made to market bars of soap in gold colored aluminum foil. A small quantity was wrapped and placed in a select group of stores. Before market research men could take a deep breath, every bar was gone from the shelves.

The proof may be found in aluminum foil shipment statistics of the Aluminum Association. Shipments for the first six months of 1955 easily surpassed shipments for any other full year with the exception of 1954. Month by month comparison between 1955 and the previous year shows the sharpest volume upcurve since the cradle days of the industry. Fifty-seven thousand, three hundred and seventy-nine tons of foil were shipped from January to June in 1955 as compared to 33,595 in the like period last year, an increase of better than 40 pct.

Major foil producers are acutely aware of the vast strides being

registered in foil packaging and have recently announced extensive expansion in an attempt to catch up with spiralling demand.

Reynolds Metals Co. recently installed a 78 inch foil rolling mill in its Richmond plant and expects to install more such units in both Richmond and Louisville operations in the very near future. This program is expected to add 20,000 tons to the annual production.

Alcoa intends to spend \$19 million to expand aluminum foil production facilities at Davenport, Iowa, and Alcoa, Tenn., plants with the aim of a 16,000 ton increase in annual production. Additional equipment will include 11 new foil rolling mills, annealing furnaces and auxiliary machinery. The company expects the percentage of total primary production which is foil to jump from 4 pct to somewhere around 10 pct.

All Products

Proof of eye appeal of foil is the fact that the beverage industry shows perhaps the biggest percentage increase in demand for aluminum foil for labels and seals.

The frozen food industry, on the other hand, was responsible to a substantial degree for the rush

because it found both protection and appearance of equal necessity. Protection is necessary because of long periods of low humidity in frozen food lockers and eye appeal is a must because the industry found itself competing with canned, bottled and fresh counterparts in addition to the intra-industry brand competition.

All manner of staples including cigarettes, dairy products and confections are attempting to enhance their chances for public acceptance with aluminum foil wrappers, bags, cartons, formed containers and hermetically sealed packets.

Two of the bigger factors in causing the unusual increase in demand are an increasingly competitive market among consumer products which tend to reduce the importance of the higher cost of foil packaging as compared with paper, and the rediscovery by manufacturers of the flexibility in design. The decorative characteristics of aluminum foil may easily be enhanced by lacquering or coating, laminating, lithographic or rotogravure printing, embossing, and shearing.

The fact that the end is not yet in sight is accentuated by the almost daily new developments in packaging.

Monthly Aluminum Foil Shipments

	1955	1954	1953	1952	1951	1950
January	7738	5213	4768	3269	4630	3190
February	7985	5546	4411	3064	4315	2961
March	8337	5919	4505	2832	4906	3456
April	8166	5699	4732	3007	4631	3231
May	8410	5281	4771	3108	4179	3328
June	8743	5937	4665	3015	3715	3537
	57,379	33,595	27,852	18,295	26,376	19,703

been too much of a pushover for labor. While "up-to-date" things may have been hard to take it is argued that SUB is more than

Labor: Will Steel Be Struck in '56?

Steel negotiators face tough bargaining next year . . . Issues will include unemployment benefits, wages, pensions, union shop, and health insurance . . . Odds are 50-50 on a walkout—By Tom Campbell.

♦ A HOT labor situation is boiling up in steel for next year. It will be complicated by (1) high riding labor power, (2) a strong business outlook, (3) a competitive fight between United Auto Workers' Walter Reuther, stockholders, Dave McDonald, and an administration that wants to go back to the White House.

This is labor's year. Agreements have ranged from 8¢ an hour to 15¢ an hour plus fringe; and in some cases plus supplemental unemployment benefits (sub). More trouble is coming as the auto and steel patterns are forced on other manufacturers.

Those who had thought a slow-up in activity might throw some cold water on labor's demands are seeing new highs made in industrial records. There is little that spells business trouble ahead in months to come.

The merging of the AF of L and the CIO is not expected to cool off the scorching competitive race between Reuther and McDonald. The can company agreements on the SUB gave Mr. McDonald a taste of blood and a foothold into the modified GAW never-never-land.

What McDonald Wants

All of which brings up the question "What will happen in steel next year?" The answer is "plenty." But to bang home the seriousness of what steelmakers face next year, let's take a look at what Dave McDonald and his friend Arthur Goldberg, CIO legal brain, are cooking up for steel.

The package which Dave McDonald will hand to U. S. Steel next year — providing business conditions support his hand—will be substantial.

(1) SUB: The steelworkers are going all out for SUB. The ground was laid by Walter Reuther and broadened by the capitulation of two major can companies. McDonald will try to get a 52-week benefit so he can say he got a better deal.

(2) WAGE INCREASE: The steel union will go after a "substantial" wage increase. The amount will depend on (a) what business conditions are and (b) what luck the union has with the SUB.

(3) VESTED PENSIONS RIGHTS: The steel workers are going after the principle of vested pension rights. This means the employee "can take it with him"

if he leaves; with payments starting at age 65.

(4) UNION SHOP: Now the steelworkers have a modified union shop. The worker can decide he doesn't want to join. The union will go after a standard union shop—join or else.

(5) HEALTH FRINGE: The pitch is to get more health and sickness benefits in the next contract. This may be used as a "give up" bargaining point.

Strike Possibility

That's the way the timetable for the steelworkers looks. There is no certainty that that is what they will get. Some steel people believe the steel industry has

Labor Homework For Businessmen

This year and next will be a heyday for labor and a headache for management. Key to the whole ball of wax will be move towards supplemental unemployment benefits. Here is some home work that has to be done:

■ Study from all angles all contracts that have been signed which embody SUB. Some are different than others. They don't promise what union leaders say they do. Don't get yourself boxed into something that hasn't any foundation in fact.

■ Put your best brains and negotiators on the track of contracts signed between now and when your next one comes up. Read the fine print and then school and train your negotiators for the "big" day next year.

■ Learn even better how to plead and argue your case with the union. Poor negotiation often leads to something you didn't have to give in the first place.

■ A good offense is often a good defense. Remember that loss of temper publicly and washing in public of dirty linen doesn't pay off. The union boys are far better at a cat and dog fight than you can afford.

been too much of a pushover for labor. While "up-to-date" things may have been hard to take it is argued that SUB is more than they will take.

So the next big question is "What will steel do about the union demands?" Part of steel management has subscribed to stability or labor peace at a price. Witness what they have done about their coal contracts. John L. Lewis won his second and substantial contract without a struggle. Remember that steel companies are a big part of the soft coal business because of captive mines.

But SUB in steel may be too much of a package for management to swallow at this time. Mr. McDonald may be aiming too high. That is why there is more than a 50-50 chance of a 30 to 40 day tieup in steel next year. If there is a strike it will be a lulu. And it would come at a time when many industrialists would least like to see it come—during an election year.

Business Slump Remote

When the chips are down and the going gets rough next June; when things look the darkest; when it looks as if there is going to be a costly strike two things may happen:

(1) The Administration may say "don't rock the boat at this time" and put its influence against a strike. That would mean capitulation because negotiations aren't going to be a tea party.

(2) Those in steel who believe in stability at a price will prevail on others to skip the strike and pay the price—part of which will have to be passed on.

Then there is the chance that there will be a big slump in business which would kick out labor's ace in the hole. But that possibility appears more than remote.

Chances are that next year's steel labor settlement will be more of a compromise than in the past. There are those in the steel industry who feel that while it might be necessary to make further concessions to labor, that labor should give something in return.

INTERNATIONAL

STEEL: France Output Up

1955 production gains 26 pct in first six months . . . Yearly output should reach 12.5 million tons . . .

Demand rising . . . Fuels problem—By F. H. Harley.

♦PRODUCTION of steel in France in the first six months of 1955 was 6,486,000 tons, 26 pct above the corresponding period of 1954. France's output for the whole year should total some 12,500,000 tons, to which the Saar will add a further 3,000,000 tons, according to Mr. Pierre Ricard, president of the *Chambre Syndicale de la Siderurgie Francaise*.

Steel demand has shown a sharp increase since mid-1954, when the economic situation began to improve. The problems of adjustment which usually follow periods of rapid expansion in economic activity have been solved, in the main, quite smoothly. On the French market, the slight disparity between steel supply and demand felt during the last few months of 1954 and the beginning of 1955 did not, as has been feared, lead to a general shortage.

Modernization Program

The production increase, which enabled the French steel industry to meet the demands of both French and foreign buyers, was achieved through installation of new plant and the modernization of existing equipment. The first modernization plan, which came to an end on January 31, 1954, involved a total outlay of \$1,288,000,000 in terms of 1954 prices, and the second program now in progress will cost an estimated \$1,027,000,000 between now and 1958. This second program will enable the combined steel capacity of France and Saar to be raised to some 18,000,000 tons a year.

Coke supply has been the crucial problem, with imports from the Ruhr at 3,000,000 tons a year. Transport charges have been appreciably higher than those applied to the transport of coke to

German steelworks over an equal distance. Although, after repeated representations, the French Government obtained last February a slight reduction in these charges, they still remain unfavorable. Lorraine works tried to lessen its dependence on foreign coke by developing techniques enabling it to use local coals, and achieved some remarkable results. Nevertheless, the problem of tight fuel affects the whole French industry, since the price of French coal and coke is above that paid by German steelmakers.

Lower Prices

French steel prices are generally lower than those of other European Coal and Steel Community producers. As a result, barely a third of total investment requirements can be provided from the industry's own resources, whereas German producers can provide some two-thirds of their capital requirements. The French industry's capital charges are appreciably higher than those of other members of ECSE. The disparity between costs of French steel and those of foreign competitors makes it of the utmost importance that a satisfactory solution be found as quickly as possible to the transport problems which also affect distribution costs, says Mr. Ricard.

Exports to Germany from France and Saar have trebled since 1952, but it would be optimistic to attribute this to the effects of the common market. The increase is largely due to Germany's particularly high demand for steel and to the fact that many Saar works have renewed trade relations with traditional customers in southern Germany.

PIPELINES: They're Pinching Plates

Approved and pending pipeline projects are keeping steel plate in a turmoil . . . Big refinery fire emergency repair and replacement needs are an added strain . . . Pipe deliveries are lagging.

◆ LINEPIPE consumers may not realize it, but the recent \$10 million fire at Standard Oil's Whiting, Ind., refinery will hit them where it hurts most—right in the steel plate solar plexus.

Estimates are that over 10,000 tons of plates will be required to rebuild and repair storage tanks destroyed and damaged by the fire. The company has sought to obtain emergency requirements through normal channels, but it's been tough going. Consequently, national emergency priorities may be requested of the Government.

This is just one of the many developments that are keeping the

linepipe and plate market boiling. For months to come, approved and pending oil and gas pipeline projects forecast continuing strong demand for electricweld and seamless pipe. This, in turn, imposes a heavy strain on plates and rounds.

Projects Building Up

Federal Power Commission announced authorizations for 4900 mi. of natural gas pipeline facilities costing \$465.3 million in the fiscal year ended last June 30. This will increase the nation's natural gas transmission capacity by 1.75 billion cu ft a day. The

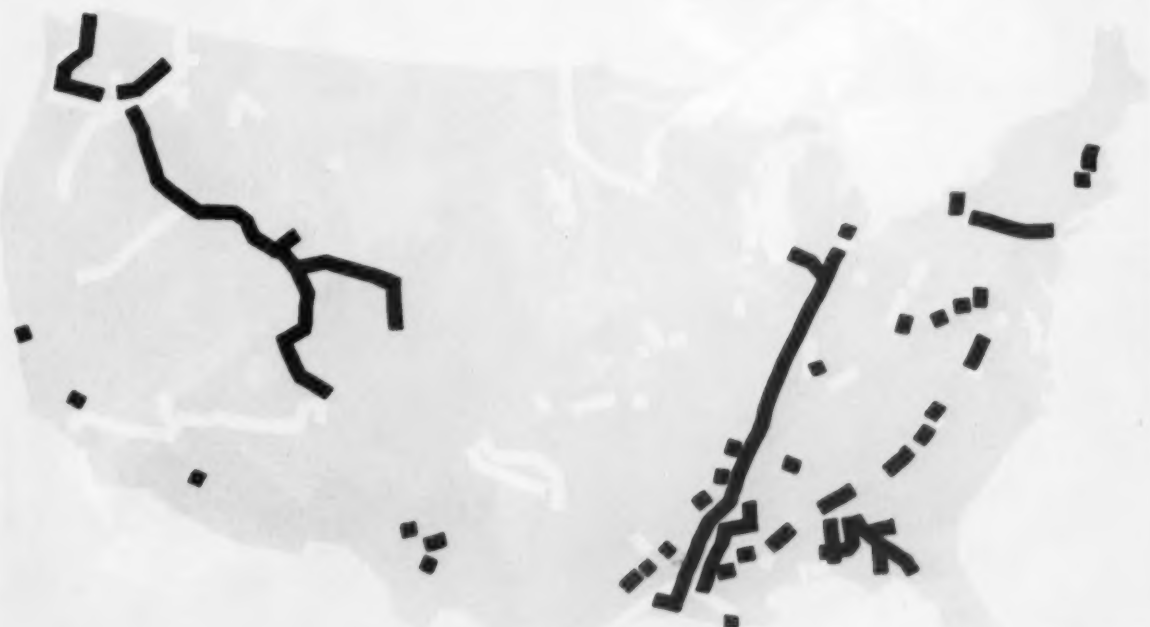
authorizations also cover 260,000 hp in compressor stations.

This is atop 6400 mi. of new transmission lines worth \$500 million approved in the preceding fiscal year.

Meanwhile, Office of Defense Mobilization is studying plans of two pipe line firms for a \$160 million petroleum transmission line from Texas to the East Coast.

Major line pipe suppliers are straining to catch up with delivery promises. But it's a losing battle. Also, the fast pace is having an effect on quality. The reject curve is running higher than usual.

Where New Pipelines Are Going



■ Certificated or under construction

□ Pending Commission action

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TITLES: How Steel Cleaned House

Multitude of confusing job names grew up in industry . . . Wage grievance program created need for standardization . . . Handbook brought uniformity, cut titles from 12,000 to less than 900—By W. Brookfield.

♦ CRACKER, Flogger, Scruffman, Hammer Backstop Man. What steel mill work is performed by these men? These are only a few of the many irrelevant, historical titles eliminated in 1953 by the Standard Title and Code Handbook.

Today, the standardization of job titles in the steel industry is a fact. Historical titles like those above are more functionally known as Product Shearman, Product Cleaner, Solids Recoveryman, and Feeder.

More important, the number of standard titles and codes used in the steel industry has dropped from about 12,000 to a compact, workable 888 job titles. Today, every job is titled on the basis of the predominant function of the job. There are 888 predominant functions established for all non-supervisory work performed in the steel industry and for each

predominant function there is one and only one job title and code.

Go Way Back

Main purpose of the handbook was to isolate all similar, but not necessarily identical jobs based on the predominant function of the job regardless of the job classification.

While job titles go back to first days of the steel industry, the need for standardization first became apparent with the beginning of the Wage Rate Inequity Program in 1945.

Because of the manner in which job titles had been applied over the years, it became a burdensome task to gather information for grievances and to compile and correlate data for establishing job classifications. In the past it had been the custom for foreman to apply titles of their choosing.

This resulted in a conglomerate

How Standardization Cut Job Titles

Here are some examples of how the Standard Title and Code Program has reduced the number of job titles and codes.

	Number of Titles and Codes Before Stdn.	After Stdn.
Group Leaders	524	1
Laborers	148	1
Product Inspectors	149	1
Hookers	110	1
Feeders	71	1
Instructors	70	1
Process Crane-man	66	1
Weighters	62	1
Tractor Operators	60	1
Equipment Grinders	59	1
	1339	10

tion of titles for jobs performing the same work within or between plants, divisions and departments. As a result, an attempt at standardization was made in 1947. This initial effort was far from successful; the actual number of titles increased rather than decreased.

In 1951 the industry's Cooperative Wage Bureau established The Standard Title and Code Committee to set up a standardized system for salaried, clerical and technical jobs. Successful in this effort, the committee reviewed all production and maintenance (hourly paid) jobs in 1952 and in January 1953 the present handbook was established.

Some 54 steel producing companies and another 20 fabricating companies covering almost 600,000 employees in the United States are using the handbook for titling jobs. Canadian steel companies have basically adopted it and companies from West Germany, England, France and South America have requested information regarding usage and application of the Standard Title and Code Handbook.



THIS MAN is known today as a "Product Shearman," an easy-to-understand job title. Formerly, job had various names, including obscure "Cracker."

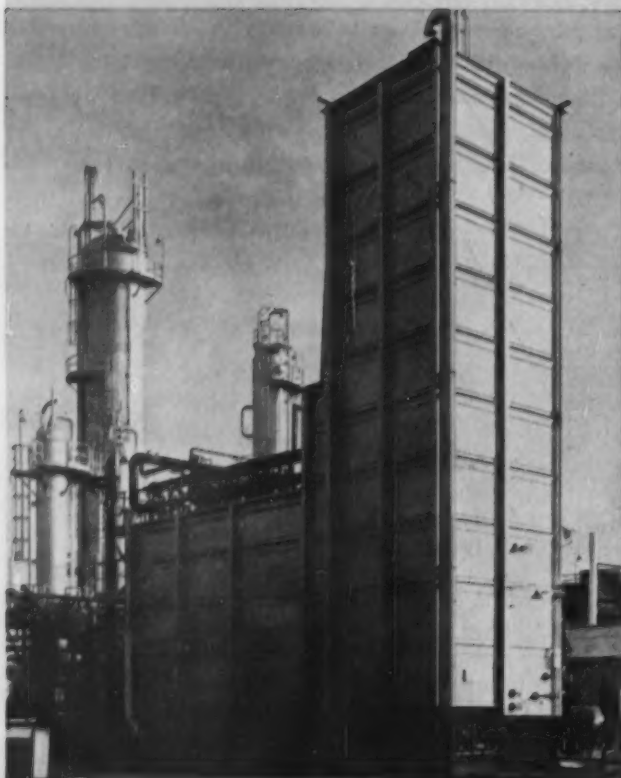
September 22, 1955

71

TIMELY NEWS

For Steel Companies Contemplating Expansion —

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generator to produce
oxygen on location
WITHOUT CAPITAL INVESTMENT!



More than 100 Air Products engineers are at your service.

**Low-Cost
OXYGEN...NITROGEN**

The steel industry will expand enormously in productive capacity during the next few years. This is the recent announcement of the heads of several of the principal steel producing companies.

It goes without saying that this expansion will be accompanied by the difficult problem of raising the large amount of capital necessary. Therefore, the fact that Air Products Oxygen and Nitrogen Generators can be installed *on-location* on a lease basis *without capital investment*, should be timely news.

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Large Capacity Tonnage Generators for unlimited quantities of oxygen and nitrogen, in standard or special models, high or low pressure cycles —

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Probe:

High airframe sales draw Senate profit check.

Profit and loss figures of airframe manufacturers are to get the magnifying-glass treatment from Washington in the months ahead.

The Senate preparedness subcommittee—one of the most influential and powerful groups at the Capitol—has served notice that it intends to “scrutinize closely” the accounting books of firms holding contracts or subcontracts to supply the government with airframes.

Senator Lyndon Johnson, D., Tex., chairman of the subcommittee, believes that the long-pull buildup of the Air Force to 137 wings will inevitably result in opportunities for excess profits.

Sales Set Record

Although he concedes there are already at least two effective methods (price redetermination, plus renegotiation) for checking excessive or unjustified profits, he serves notice that his investigating subcommittee is going to keep an eagle eye on the books of Air Force contractors as an added precaution against runaway profits.

In the first of a series of reports, the Senate subcommittee calculates total net sales of 17 airframe manufacturers in 1954 at \$6.1 billion. This is an all-time record for peacetime. The war year of 1944 saw the highest net sales on record—\$8.2 billion worth.

Offer Weapons Study

Preparations that led to weapons production for the Army in World War II are described in a new volume of history just published by the government.

Entitled “The Ordnance Department: Planning Munitions for War,” the book is the first of three that will tell how guns, tanks, and other weapons were brought along from the design stage to the point of combat use.

The initial book analyzes the difficulties met by Army Ordnance

personnel during the time just preceding U. S. entry into the war. It contains a detailed treatment of weapons research and development activities.

A second volume, with the same title, will cover the work of the Ordnance Dept. (now the Ordnance Corps) in the zone of the interior. Ordnance operations overseas will be described in a third volume.

Superintendent of Documents, Government Printing Office, Washington 25, D. C., sells the first volume at \$4.25 a copy.

Tactics:

Standard size shells simplify atomic gun firing.

Tomorrow's soldier may not be able to fire an atomic cannon from the hip, but he's going to be working with a less cumbersome piece of ordnance than the 280mm. atomic gun.

The roadhogging, 85-ton, gun-tractor combination is to be retired soon. In its place, the Army will use the conventional 8-in. gun, with atomic ammunition scaled down to fit it. Eventually, atomic shells may be reduced to even smaller size to permit close-in support of tactical units.

DEFENSE

Despite its bulk, the 280mm. cannon, with its 20-mile firing potential, was considered important enough to warrant shipment to forces at overseas stations.

Needed Special Shell

Movement of the guns from place to place has presented difficulties, and some have turned over or bogged down on foreign roads.

Though the big guns can fire shells with either the customary high explosive or atomic warheads, the ammunition has to be of special size, complicating the munitions production job.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representative.

Reusable missile containers, 250, \$610,500, American Pipe & Steel Corp., Alhambra, Calif.
Control equipment, \$327,400, The Sperry Corp., Great Neck, N. Y.
Special tools, \$269,087, Lockheed Aircraft Corp., Burbank, Calif.
Aircraft, 10, \$3,394,920, General Dynamics Corp., San Diego, Calif.
Aircraft kits, 100, \$4,400,000, Lockheed Aircraft Services, Burbank, Calif.
Indicator, control, 2978, \$980,576, National Company, Inc., Malden, Mass.
Machinery, \$525,000, Sundstrand Machine Tool Co., Rockford, Ill.



FASTER: Wind tunnel shot of research model shows new body design credited with giving big speed increases in supersonic flight. Held by inventor Richard Whitcomb of NACA, model has body pinched in at wing base.

EXPANSION IN INDUSTRY

Steel:

Copperweld puts \$12 million into product expansion.

Copperweld Steel Co. intends to spend \$12 million for expansion and modernization of all its main manufacturing divisions. The aim of the project, scheduled for completion in 1957, in addition to greater capacity is a broadening of the range of Copperweld products.

Bulk of the money, \$10 million, will be expended at the Warren, Ohio Steel Div. Melting facilities will be improved and enlarged to a capacity of 660,000 tons annually. Additions will also be made to the rolling and finishing facilities as well as installation of a new 35 in. two high reversing primary mill. The effect of the expansion project on this plant is expected to be a 40 pct increase in shipments.

The Wire and Cable Div. at Glassport, Pa., and the Shelby, Ohio, Seamless Tube Div. will each benefit to the tune of \$1 million worth of improvements.

Improve Coke

Construction of a 2000 ton per hour coal unloader and related handling facilities is now underway at Clairton Works of the United States Steel Corp. The object, according to the company, is to insure a more uniform grade of coke for blast furnaces in the Pittsburgh, Youngstown area.

More Refractories

The Harbison Walker Refractories Co. has opened a new plant at Leslie, Md., to produce silica refractories.

The plant is a 100,000 sq ft standardized steel structure produced and erected by the Luria Engineering Co. of Bethlehem,

Pa. The new manufacturing unit is Harbison Walker's 33rd in this country and Canada. It is the latest step in a \$35 million expansion program launched in 1951.

The site was chosen because of its proximity to a supply of raw materials and because it is strategically near important users of refractories in Baltimore and Philadelphia.

Supplies AEC

The foundation has been completed for a new Norton Co. manufacturing plant in Huntsville, Ala. The \$1.285 million facilities are being built to produce fused

magnesia, fused zirconia, boron carbide and other special materials for the Atomic Energy Commission.

More Titanium

Rem-Cru Titanium, Inc., has purchased five buildings and 10 acres of land in Midland, Pa., from the Crucible Steel Co. of America as a step in the company's program for the expansion of its titanium mill products.

The buildings are equipped with modern materials handling facilities, pickling lines and other metal processing equipment which can easily be converted.

Steel: What Mills Shipped in July

As Reported to the American Iron and Steel Institute

STEEL PRODUCTS	JULY, 1955				Pct of Total Shipments	YEAR TO DATE				Pct of Total Shipments
	Carbon	Alloy	Stainless	Total		Carbon	Alloy	Stainless	Total	
Ingot	38,946	12,311	1,220	49,465	0.8	214,590	97,890	16,741	328,141	0.7
Blooms, slabs, billets, tube rounds, sheet bars, etc.	170,582	42,053	1,477	214,062	3.4	1,302,586	307,349	10,456	1,620,401	3.3
Skelp	13,461			13,461	0.2	96,888			96,888	0.2
Wire rods	78,975	1,080	640	80,695	1.3	639,682	13,129	5,039	658,050	1.4
Structural shapes (heavy)	353,702	2,032		355,734	5.7	2,805,658	22,150	48	2,827,853	5.5
Steel piling	31,625			31,625	0.5	214,167			214,167	0.4
Plates	479,482	24,282	2,041	505,805	8.1	3,510,980	152,490	12,984	3,676,462	7.6
Rails—standard (over 60 lbs.)	90,438			90,438	1.6	750,218	1		750,219	1.6
Rails—all other	4,715			4,715	0.1	42,023	1		42,024	0.1
Joint bars	7,676			7,676	0.1	42,221			42,221	0.1
Tie plates	30,116			30,116	0.5	198,758			198,758	0.4
Track spikes	7,827			7,827	0.1	58,117			58,117	0.1
Wheels (rolled & forged)	21,763	12		21,775	0.4	168,046	796		168,842	0.3
Axles	8,216	7		8,222	0.1	61,922	40		61,962	0.1
Bars—hot rolled (incl. light shapes)	473,213	100,536	2,812	576,561	10.0	3,890,987	1,221,023	24,774	4,936,884	10.2
Bars—reinforcing	177,158			177,158	2.8	1,190,777			1,190,777	2.8
Bars—cold finished	99,893	18,758	3,417	122,068	2.0	855,979	164,175	30,869	1,050,223	2.2
Tool steel	797	6,707		7,504	0.1	8,015	68,630		64,645	0.1
Standard pipe	245,148	34		245,179	3.9	1,678,393	482	2	1,678,877	3.5
Oil country pipe	188,545	34,618		223,163	3.1	1,180,801	240,924		1,421,725	3.0
Line pipe	295,756			295,756	4.7	1,671,033			1,671,033	3.5
Mechanical tubing	51,989	16,879	406	69,273	1.1	398,970	136,567	2,886	538,443	1.1
Pressure tubing	17,804	1,783	1,276	20,863	0.4	127,493	15,688	8,523	151,674	0.3
Wire—drawn	198,514	2,920	1,926	203,360	3.2	1,763,911	26,245	10,037	1,800,193	3.7
Wire—nails & staples	48,607			48,607	0.8	409,020		1	409,021	0.8
Wire—barbed & twisted	8,579			8,579	0.1	90,915			90,915	0.2
Wire—woven wire fence	17,465			17,465	0.3	227,546		1	227,547	0.5
Wire—bale ties	7,884			7,884	0.1	44,854			44,854	0.1
Black plate	49,417			49,417	0.8	463,178			463,178	1.0
Tin & tern plate—hot dipped	76,473			76,473	1.2	587,998			587,998	1.4
Tin plate—electrolytic	291,405			291,405	4.7	2,637,432			2,637,432	5.9
Sheets—hot rolled	674,213	25,980	2,709	702,902	11.2	5,158,064	199,888	22,821	5,377,223	11.2
Sheets—cold rolled	1,067,723	4,941	11,439	1,104,113	17.7	8,450,707	31,537	78,081	8,560,295	17.7
Sheets—galvanized	205,211			205,211	3.3	1,675,607	888		1,676,495	3.3
Sheets—all other coated	20,830			20,830	0.3	152,381			152,381	0.3
Sheets—enameling	16,290			16,290	0.3	122,007			122,007	0.3
Strip—hot rolled	142,419	2,130	436	144,985	2.3	1,193,858	16,357	2,954	1,213,169	2.5
Strip—cold rolled	88,558	911	18,594	100,063	1.6	705,009	7,991	153,240	766,240	2.0
TOTAL SHIPMENTS										
(1955)	5,892,453	399,744	48,480	6,340,677	100.0	44,775,292	3,080,137	395,327	48,250,756	100.0
TOTAL—PRIOR YEAR										
(1954)	4,290,480	248,977	30,712	4,569,170		35,375,212	2,136,213	250,204	37,761,709	

*Revised.



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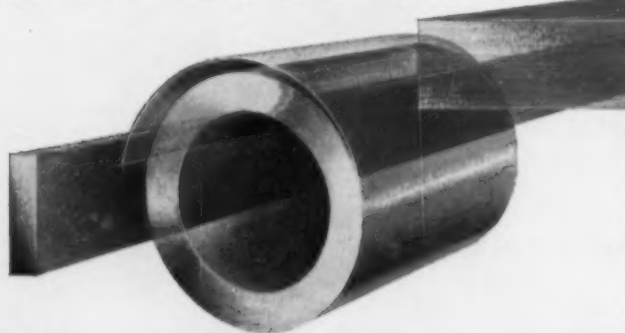
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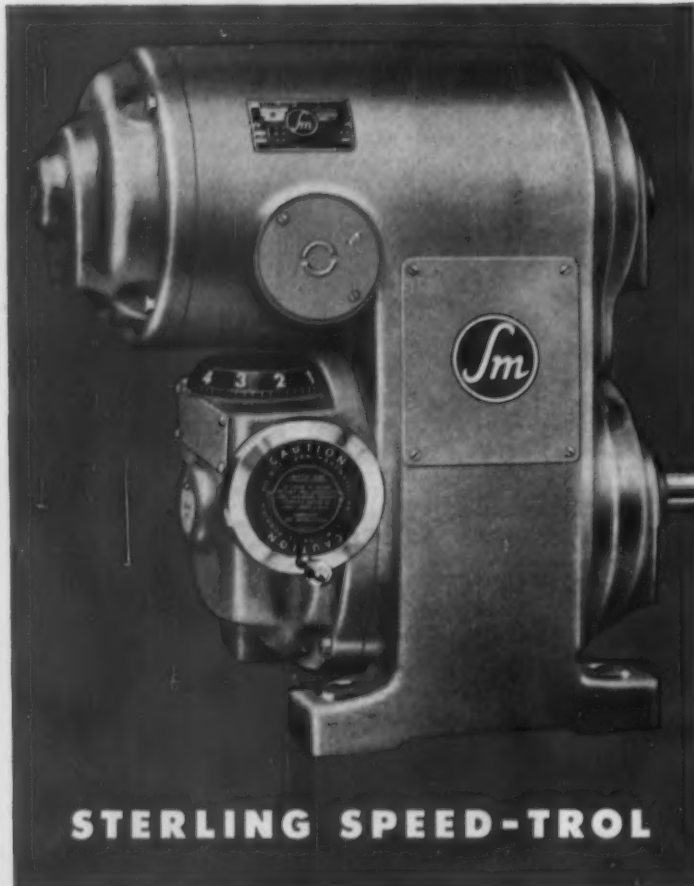
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Report to Management

Spotlight on Detroit

This is the season of noise and fanfare in Detroit, when 1956 models start making their appearance, accompanied by blasts of publicity and reams of advertising.

It's important to evaluate what you read about these auto previews, what executives say about 1956 plans, as well as looking over the merchandise with an eye as to whether or not you are "in the market" for a new model yourself.

What automakers do in the next twelve months is going to have a lot of effect on how your metalworking business goes. Even if you are not a direct supplier, the auto industry's scope is so broad that it affects the entire economy.

In the past year, Detroit has shared the plaudits for the surging economic boom on one hand. On the other, it has been pointed to as the big problem in rising consumer installment buying. How it goes in 1956 should not be underestimated in importance.

What 7 Millions Cars Mean to You

It now appears that auto executives expect to build more than 7 million cars in the 1956 model year. This will be somewhat less than this year when the total passenger car output should pass 7.4 million.

But a comparison with this year is not too significant. No one could expect the car buying surge that characterized 1955 to last forever. That figure, if attained, would be better than 1953, which was far from a slow year in itself.

That should be a pleasing goal and one that should more than satisfy business in general. It wouldn't be up to this year's amazing figures, but would be good enough to assure a good year for the automakers, auto workers and their suppliers.

It could be a better year than that. Remember, these same executives, who up to this year were known for hitting their market on the nose, underestimated this year by more than a million.

There are two things that could hurt: prices and credit. Credit buying will be tougher next year and such things as the "balloon note" won't be as prevalent. And it's the established pattern that prices will be up 5 pct across the board.

But the money should be there to sustain an active market. It's expected that higher wages, lower taxes, more overtime, will result in a full \$10 billion more in disposable income for 1956. That will buy a lot of cars, and appliances, too, for that matter.

Time to Take Inventory

Since the inventory recession of 1954, inventory building has taken on a new role. It's generally accepted that inventory liquidation during that year hurt more than any single factor.

It's difficult to evaluate that aspect of business today. According to some figures, inventory building is going on at a rate almost equal to that of 1953. At the same time, stocks of some materials, notably steel and other metals, are at the hand-to-mouth stage.

Inventory buildup is generally followed by inventory liquidation. This may not be the case today if and when industry gets its stocks up to the comfortable point. Too many were burned this year from cutting back too far. When the upturn continued far beyond most expectations, they suffered the penalty.

This is not likely to occur in 1956. Those who heeded the steel industry in 1954 and decided to keep adequate stocks, even when business was at a low ebb, came out ahead. More businesses than ever will continue to protect themselves with working inventories.

INDUSTRIAL BRIEFS

One Million Pushes . . . A new record of one million pushes from Koppers coke ovens currently in production has been set by the Philadelphia Coke Co., subsidiary of Eastern Gas & Fuel Associates at the plant in Philadelphia. Moreover, the ovens are still in production, adding each day to this impressive total.

Gets New Name . . . The U. S. Spring & Bumper Co., since 1954 a subsidiary of Rheem Mfg., took the name of Rheem Automotive Co., Div. of Rheem Mfg. Co. as a measure to clarify the relationship of the two companies.

New Electric Furnace . . . The Ajax Engineering Corp., Trenton, N. J., has concluded an agreement with Otto Junker G.M.B.H., of Lammersdorf, Germany, and Birlec Ltd., Birmingham, England, for the development and marketing of the line frequency (60 cycles) coreless induction melting furnace. This furnace will be of particular interest to foundries melting high quality cast iron.

Acquires Company . . . Negotiations for the acquisition of Garrett Oil Tools, Inc., Longview, Texas, has just been completed by the U. S. Industries, Inc., New York.

District Office . . . The Baldwin-Lima-Hamilton Corp. announces the opening of a district sales office for hydraulic presses and testing equipment at 60 East 42nd St., New York 17, N. Y.

New Sales Territory . . . Cincinnati has been selected as headquarters of a new district sales territory for the Metal Processing Chemicals Dept., Pennsylvania Salt Mfg. Co., Philadelphia.

Supplies Turbines . . . Allis-Chalmers Mfg. Co. has been awarded a contract to supply two hydraulic turbines, one of which will be the largest of its kind in physical size and capacity in the U. S., to the Tri-Dam Constructors, contractors for the Oakdale and South San Joaquin irrigation districts, Calif.

More Air Conditioning . . . Sales of central residential air conditioning units will increase nearly 1000 per cent with the next 10 years, according to a General Electric executive. Major factor in this growth is the rapidly increasing number of new homes being built and sold with central air conditioning equipment already installed.

Conference Coming Up . . . The Fifth Transport Aircraft Hydraulic conference under the sponsorship of Vickers, Inc., Detroit, will be held Nov. 2-3 at the Park Shelton Hotel, Detroit. This year's theme will be "A Look to the Future."

Produces Radioisotopes . . . For the first time, a private American firm, the Nuclear Science & Engineering Corp., Pittsburgh, is producing radioisotopes in cyclotrons and supplying them to industrial and medical users. The Atomic Energy Commission, the only former U. S. supplier, has discontinued its program.

Headquarters Move . . . The Central Atlantic Coast Technical Field Section, International Nickel Co.'s Development and Research Division is now located in the Abington Building, Abington, Pa. The Section, which embraces most of the eastern seaboard, furnishes industry with information and assistance relating to nickel and nickel alloys.

New Distributor . . . Blackman & Neutzel Machinery Co., St. Louis, has been appointed to handle Hydra-Feed Machine Tool Co.'s automatic and tracer lathes in the south central states including Southern Illinois, Missouri, Oklahoma and Kansas.

College Receives Gift . . . Wheeling Steel Corp., Wheeling, W. Va., announced that the company has made a gift to Wheeling College to provide scholarship opportunities for children and grandchildren of Wheeling Steel employees during the academic year of 1955-1956 if they meet requirements set by the college faculty.

DRILLS 7% MORE GRAY IRON VALVE BODIES PER SHIFT



...thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE. . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 41, Niagara Falls, N. Y. 04-01

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... rolled strip steel ...
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Made and delivered as specified—ready to meet your toughest demands—hallmarks of ALAN WOOD strip steel.

Produced by modern, up-to-date, continuous mills under the most rigid metallurgical control, ALAN WOOD strip possesses the "custom-produced" requirements of a superior product . . .

qualities that build extra selling power and repeat sales into your products.

If you require hot or cold rolled sheet or strip steel . . . choose a specialist who understands your production problems . . . and delivers according to your specifications.

IRON PRODUCTS
"Swede" pig iron
STEEL PRODUCTS
Plates (sheared)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip

ROLLED STEEL
FLOOR PLATE
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SM-13



Can Automakers Sell 7.5 Million?

Ford's McNamara thinks that's a reasonable goal, is confident of passing 7 million . . . Chrysler's push button shift leads off year's engineering developments . . . Faceliftings cost—By T. L. Carry.

♦ **TRADITION** in Detroit makes the new model season the prediction season. Key auto executives choose this time to crawl out on the limb with their educated guesses of how many cars the industry will make or sell, with their own company, of course, picking off a greater share of the market than ever before.

Ford's early new model introduction puts Robert S. McNamara, youthful head of the Ford Div., in the van among the forecasters. Mr. McNamara, although less than a year on the job as head of the division, has the optimism that is characteristic of an industry that thrives on optimism as a commodity.

Not Guessing . . . The former Harvard University professor says that the industry will sell 7.4 million cars in the 1956 model year, predicts that the figure could go higher than 7.5 million.

This, according to Mr. McNamara, is not just wild guessing. It is based on a thorough study of the market potential for new cars and also on three other factors.

The first reason is the huge wave of prosperity which is currently sweeping the country. Consumers have a definite confidence in the stability of the economy.

Because people are presently making more money than ever before, they are spending more and saving less. In addition, it is not only easier to finance purchases, but consumers, because of their higher incomes, are able to assume bigger financial obligations than they were in the past. Mr. McNamara says that consumer income

in 1956 will be \$10 billion higher than it was in 1955.

More Selling . . . Besides prosperity, Mr. McNamara's market predictions are based on what he calls product advancement. Over the years no other product has advanced faster from a styling standpoint than the automobile. Although the new Ford is only a facelifting of the 1955 car it cost 11 times more than the previous most expensive facelift in 1953. Included in the changes beside a new grille and chrome trim is a Thunderbird engine which produces 202 hp with a 4-barrel carburetor.

The third reason Ford expects a 7-million car year is the increased emphasis the industry has placed on selling. Sales promotion efforts during the past year have been increased 35 pct, compared to only 3 pct for other industries producing other types of durable goods. This has paid off handsomely for Ford.

In the 10 months since the 1955 models were introduced Ford dealers sold over 1,600,000 cars and trucks, the largest number in the history of the company both for sales and dealer profits. During the 1955 run, the company never had enough cars to supply dealers, according to Mr. McNamara, despite the fact that plants worked overtime to fill the demand.

To meet the expected increase in demand for 1956, Ford has increased its production capacity by 250,000 cars. It might also be added that this year Ford is introducing its new line much earlier than Chevrolet. There is no doubt Ford wants to get a good jump on the number one competitor in the low price field.

No Red Trade

Although General Motors is considering selling its cars behind the Iron Curtain in Europe, indications are that automobile trade with



NEW FORD has 202 hp engine with 4 barrel carburetor plus new grille and chrome trim. Model change cost 11 times more than expensive '53 switch.

New process gives more corrosion-proof chromium finish

♦ Hard, wear-resistant Unichrome Crack-Free Chromium plated directly on steel stops rust . . . proves superior to ordinary chromium

♦ Improved non-galling, non-seizing finish achieved also with United Chromium's process

Chromium can now be plated without the network of fine cracks which occur in ordinary chromium more than a few ten thousandths of an inch thick. United Chromium has developed a solution for Crack-Free Chromium Deposits.

SALT SPRAYED 100 HOURS — NO CORROSION

Splined steel shafts used in washing machines were plated directly with chromium and then salt-spray tested by the manufacturer. With .0005" of ordinary chromium, the corrosive penetrated the cracks and shaft surfaces were completely covered with rust in less than 100 hours. With .0005" of Unichrome Crack-Free Chromium, surfaces were unblemished after 100 hours.

LONGER LIFE FINISHING

Unichrome Crack-Free Chromium is a gray matte plate, but buffs readily for high luster. It does not depend on scarce nickel for long life.

In other ways, too, the new finish proves superior to ordinary chromium. One user increased life of chromium plated dies 20% by switching to the new process. Another was able to take faster and deeper grinding cuts in plated cams and end the service failures encountered with ordinary chromium.

This is just one of many United Chromium developments in processes, equipment and materials which provide opportunities to cut your finishing costs . . . opportunities to turn out a better product through a better finish. We'd welcome the chance to work with you.



METALLIC and ORGANIC FINISHES...EQUIPMENT

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**"Maybe we'd better
scrap some of our
ideas about scrap?"**

**This may
be the
solution**

Cracks in parts are one main cause for scrapping. When these cracks are not discovered until after machining or at final inspection, time spent in processing the parts is a dead loss!

Inspection with Magnaflux' Methods finds all cracks—from whatever cause—at any stage of manufacture. By finding cracks early you can correct the

Do YOU think of your scrap in terms of material costs only? Actually it's the time and labor that have been wasted upon it that is really costly.

Accepting an arbitrary rejection rate as inevitable, is expensive and usually unnecessary. The solution is often so simple it can be easily overlooked.

cause before parts are run in quantity. Result: almost no time or money is wasted on defective parts.

Inspection with Magnaflux is fast and cheap—saves many times its trifling cost. Ask to have a Magnaflux engineer show you how it can cut *your* costs—or write for new booklet on **LOWER MANUFACTURING COST.**



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Detroit 11 • Dallas 19 • Los Angeles 38

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Sept. 17, 1955	124,434	21,003
Sept. 10, 1955	82,564	15,982
Sept. 10, 1954	59,797	14,229
Sept. 11, 1954	71,423	13,320

*Estimated Source: Ward's Reports

Russia is not going to become an industrywide practice, at least in the near future.

Ford Motor Co. will not comment on the possibility of doing business with the Reds and a statement from the Chrysler Corp. indicates that it is less than enthusiastic about the possibility.

C. B. Thomas, Chrysler vice-president and head of the Export Div. is extremely cautious when approached on the subject.

"Chrysler Corp. will continue to be guided by its long standing policy of observing the foreign trade practices recommended by the Federal Government. In the area of East-West trade, Chrysler will be guided solely by the decisions of our government as to what is in the best interest of our country," he says.

There are other reasons that are almost as important when it comes to considering the feasibility of selling to Russia.

First of all, the amount of business that could be done is peanuts when considered with the volume of business that is carried on with other foreign countries. The low standard of living in Russia and her satellites in Europe would necessarily limit the amount of cars that could be sold there.

Chrysler:

Push button shift
is 1956 feature.

Not to be outdone by a cross-town rival, Chrysler Corp. also displayed its new line of cars to newsmen last week at its proving grounds in nearby Chelsea, Mich.

Biggest selling point for the new Chrysler line is a push button automatic drive control which will be

standard on all the corporation's cars equipped with automatic transmissions.

The controls are operated from the instrument panel at the left of the steering wheel, a position which places it safely out of the reach of the inquisitive little hands of small children.

Finger Control

There are separate buttons for neutral, low, drive and reverse. A mere touch of the finger can put the car into the desired motion, but there are certain safeguards which the company has taken. The car's engine cannot be started unless the neutral button is engaged and it cannot be accidentally pushed into reverse if the vehicle's forward motion is more than 10 mph.

Chrysler also has a novel addition to motoring—a high fidelity record player with specially designed records that give up to 45 minutes of music or 1 hour of speech. Offered as optional equipment, the record player was designed by CBS Laboratories. It plays through the radio's amplifier system and is located under the center of the dashboard. It is so

AUTOMOTIVE NEWS

designed that the position of the needle is not effected by the speed or angle of the car.

L. L. Colbert, president of Chrysler, can take justified pride in the corporation's comeback since its share of the market fell to less than 13 pct in 1954. With the introduction of the 1955 models until the end of the model run in August, Chrysler's sales cover 17.7 pct.

After 20 Pct

Mr. Colbert believes that Chrysler is out to get 20 pct of the nation's automobile business in 1956 and once that goal is reached the corporation is going to raise its sights on an even bigger share.

Tooling costs for the 1956 cars are estimated at \$175 million. This amount is exclusive of \$130 million spent for new plants and production facilities including the ultra modern Plymouth engine plant.

In general appearance, the new cars slope downward from the back in a wedge shape.

THE BULL OF THE WOODS

By J. R. Williams





THIS IS WHAT CAN BE DONE
WITH THE CECOSTAMP . . .

A 48 x 36 Cecostamp is making road signs, metal ceilings, auto body parts, roofing trim and grain bins at an up-to-date metal stamping concern in Canada.

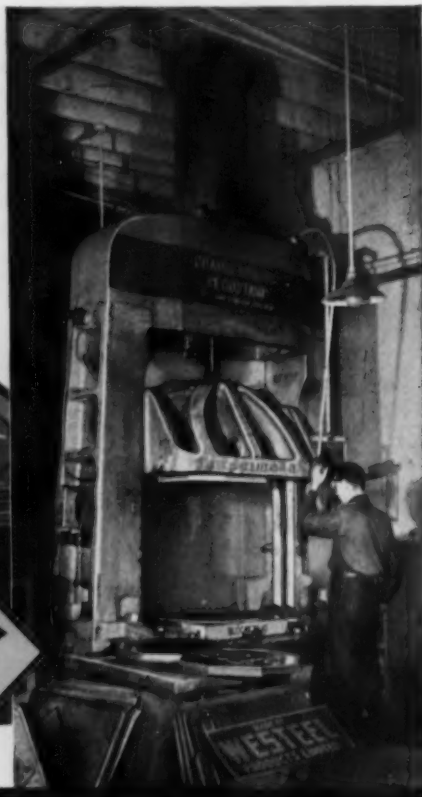
Formerly made on a rope drop hammer, these stampings as produced on the Cecostamp are sharper and more distinct, production has been increased up to 10% and rejects have been greatly reduced, saving time and material. Operation is also easier and safer.

Have you a stamping problem that might be solved by installing Cecostamps? Investigate this air-operated impact type drop stamp, using blows of controlled intensities, the control being completely and instantly at the will of the operator.

*Write for
a copy of
our latest
Bulletin
No. 30-L-5*



Above are a few of the familiar road signs produced on the versatile Cecostamp.



CHAMBERSBURG CECOSTAMP

CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PENNSYLVANIA



THIS WEEK
IN
WASHINGTON

Senate Pushes New Monopoly Hunt

General Motors looms as special probe target . . . Investigators quiz auto parts makers, union officials and car dealers . . . Will charge GM swallows competition, may ask trust suit—By G. H. Baker.

♦ **ANTI-MONOPOLY** investigators from Congress are stalking big business again.

Sales practices of several larger firms are to come under the guns of Senate inquiry in the months ahead. At least one corporation (General Motors) may be subpoenaed for a lengthy quiz session under the floodlights.

A congressional recess is always a fruitful time for carrying out investigations of business. The few committee members who remain in Washington after the Senate and House adjourn find less competition in the race for newspaper and television prominence.

Jump on Business . . . It's a relatively easy matter for politicians who are "on the make" to thrust the flaming torch of inquiry under the tired seat of big business. Dramatic charges and allegations make the headlines. The quiet replies made by businessmen often go unnoticed.

Senator Kilgore, D., W. Va., is chairman of a Senate Judiciary subcommittee looking into possible antitrust law violations. He has been nursing a grudge against General Motors since last spring when Pres. Harlow Curttice of GM declined a subcommittee invitation to come to Washington and testify. Sen. Kilgore now hints he may use his subpoena powers and force Mr. Curttice to take the witness stand.

The GM president's appearance, particularly under subpoena, would get the desired headlines.

Could Be Rough . . . If Kilgore goes ahead with present plans, GM is in for a rough time. The subcommittee staff has been talking to a number of smaller manufacturers of automotive parts, to officials of the CIO United Auto Workers, and to car dealers and automotive service shops.

The staff plans to charge that GM has been gobbling up its competitors at an "alarming" rate, and that its "dominant" position in the automobile business may be rapidly approaching the legal status of "monopoly."

Union Fights Union . . . Is it proper to classify a union as an "employer?" Before you answer yes, take another look: The government says in effect that the "conduct of business" is not the primary purpose of a union, and therefore a union is not properly an "employer."

Issue arose recently when the National Labor Relations Board held the AFL Teamsters was not an "employer," and hence was not guilty of an unfair practice charge when it tried to stop some of its office help from joining the AFL Office Employees' union.

Now the AFL Office Employees is asking the U. S. Court of Appeals in Washington to force the NLRB to recognize the AFL Teamsters as an "employer."

Case may go all the way to the Supreme Court for settlement, as the AFL Teamsters' contention that it is not a "business enterprise" is subject to plenty of argument.

Small Firms Gain . . . Small companies continue to contribute substantially to the Navy buying program, having handled contracts valued at \$750.1 million in fiscal 1955.

President Wins By Landslide

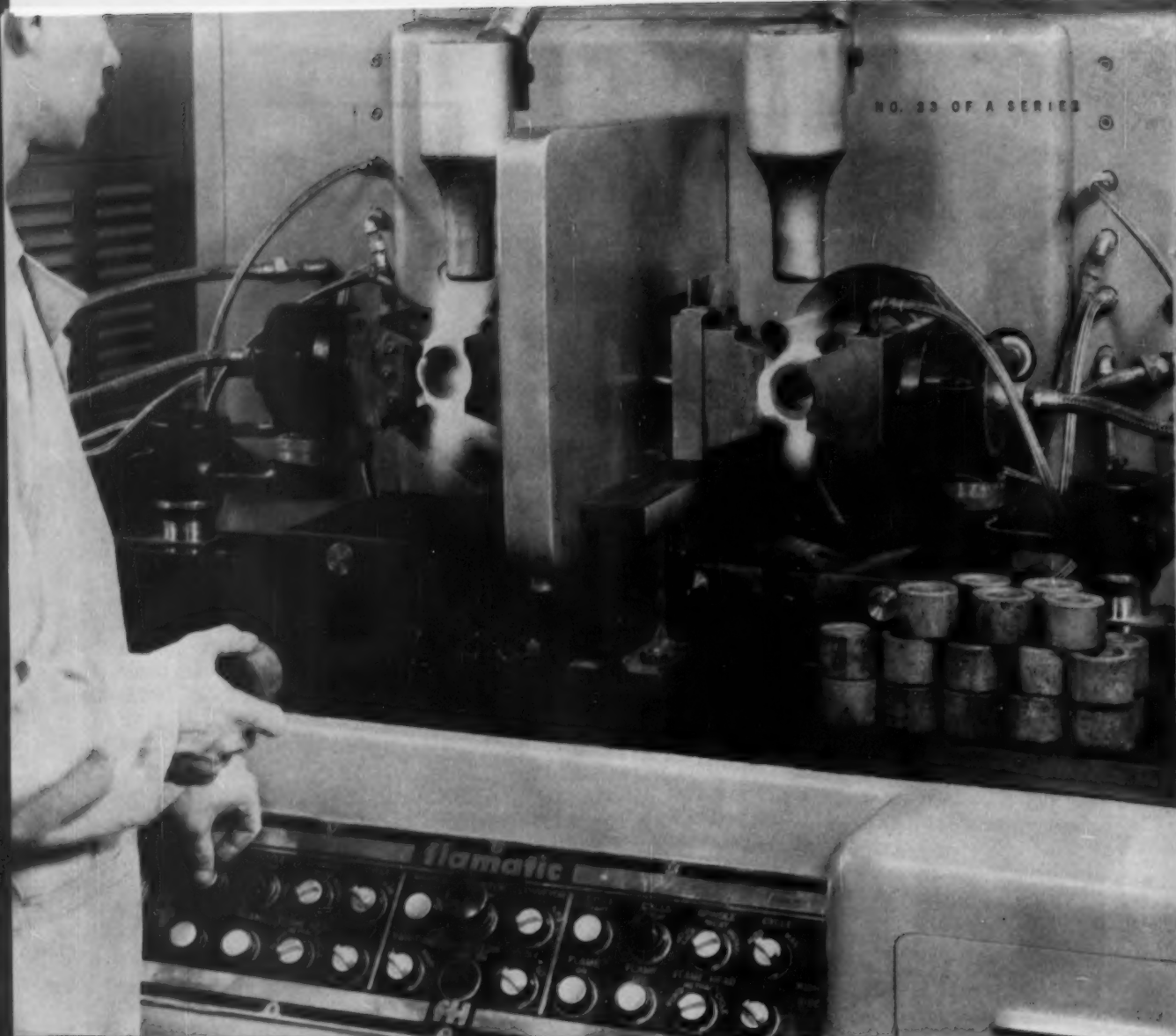
President Eisenhower is to be re-elected by a whopping majority next year, if a straw vote taken in Cleveland suburbs is a fair sample of national opinion.

Poll was conducted by Rep. William E. Minshall, a first-term Republican who speaks for the communities south and west of Cleveland. Mr. Minshall asked 15,000 independent voters and 20,000 Republicans in his district if they'd support Ike in '56.

Of the 7492 returns, 7384 said yes, 63 said no, and 45 said they were undecided. This is about 99 pct.

Mr. Minshall also asked his constituents to name their favorite candidate if Mr. Eisenhower refuses to run.

Response was a landslide for Secretary of Treasury George Humphrey.



Chrysler saves 10 operations

with flamatic hardening —Imagine the drop in unit costs when you save ten operations on one part, including plating, straddle facing and turning, re-broaching, carburizing, tempering, two washings, and three inspections.

All these operations were found unnecessary as a result of one decision at Chrysler Corporation's Highland Park plant: to switch to Cincinnati Flamatic for hardening the OD of this torque converter overrunning clutch hub.

A review of your own operations may reveal an opportunity for similar savings with Cincinnati Flamatic selective hardening. If you'd like to learn about other types of operations, from job lot to line production, write for Publication No. M-1861.



flamatic

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

As figured by the Navy, the amount of the awards represents 73.8 pct of procurements judged as being within the small-company production potential. Total procurements from both large and small sources during the year amounted to more than \$3.9 billion.

In the past six years, small business has signed contracts aggregating \$6.7 billion, or 20.4 pct of the \$32.9 billion spent for procurement.

Push Atomic Work

Industrial harnessing of the atom took another long stride forward this week with government approval of Babcock & Wilcox Co. plans to build and operate a new \$2 million fuel element fabrication plant at Lynchburg, Va.

The Atomic Energy Commission also has approved construction of a modified "swimming pool" reactor near Columbus, O., by the Battelle Memorial Institute, of Columbus. This facility will be licensed to process and fabricate unirradiated uranium-235.

Investment:

Plant outlays climb toward record 1953 figure.

Plant and equipment investment by American business is climbing steadily toward a robust \$27.9 billion for 1955, about 3 pct more than was planned at the beginning of the year.

To keep this program going, businessmen propose outlays at a record adjusted annual rate of \$29.7 billion in the fourth quarter. Spending in the current quarter was planned at an annual rate of \$29 billion. In the first and second quarters, the rates were \$25.6 billion and \$27.2 billion.

Durable Goods Lead

If scheduled expenditures are made for the remainder of the year, outlays for the full 12 months will be only 1 pct lower than the peak figure of \$28.3 billion in 1953.

Manufacturing concerns intend to build their spending up to al-

most \$11.2 billion for the year, exceeding the 1954 total by 1 pct.

Bulk of the load is being carried by durable goods producers, who contemplate topping 1954 by 5 pct. Nondurable goods industries anticipate a 2 pct decline in their outlays, compared with those last year.

Nonrail transportation investment is to rise by 3 pct for the year. Railroads, registering income gains, are to surpass 1954 expenditures by \$56 million, or 7 pct.

Commercial and miscellaneous categories are scheduling an 8 pct increase, while mining industry outlays are to drop by the same percentage. The public utilities increase is to be 5 pct.

Plan Manganese Test

Ores Beneficiation, Inc., Joplin, Mo., will build a pilot plant to study a new process of treating low-grade manganese ores under a contract with the General Services Administration.

The new firm will build a plant at Joplin and run tests for at least the next 15 months. A process developed by the Bruce Williams Laboratories will be tested. Plant will use 300 lb per hour of slags and low grade ores from Maine, Minnesota, Arkansas, Arizona, New Mexico and Mexico.

WASHINGTON NEWS

Maximum cost of the study, to be underwritten by the government, is \$202,000. All test data will be turned over to the government.

Stockpile:

Mines see shutdowns without program or substitute.

Strategic minerals mining industry, "shocked" by President Eisenhower's veto of a bill to require continued government purchases of its output, is going to renew a plea for aid.

Argument the industry will use: "We don't believe that the country will be content to see its strategic mineral mines close down once again as they have been forced to do twice within the past 10 years."

The industry is hoping that the new Office of Minerals Mobilization in the Interior Dept. will develop "adequate" programs without legislation to keep strategic mineral mining operating. But if it doesn't before next January, the industry warns it will again ask Congress to pass a bill forcing government stockpile purchases.

More Stockpiling

Strategic minerals include manganese, tungsten, chrome, asbestos, mica, beryl, and columbium-tantalum bearing ores. Efforts have been made in the past to add antimony to the list.

As finally passed this year, the bill would require the government to continue stockpiling strategic minerals through the end of expiration dates already set in 1957 and 1958. A ceiling of \$150 million would be placed on the program.

The government has filled the goals in terms of tonnages for several of the minerals, and is nearing completion of others. The industry fears that when buying is cut off as goals are filled, domestic mining will become obsolete.



"There's no break in the tight nickel market, Jones. Buy your own."

DIAMOND MACHINE TOOL COMPANY

PICO, CALIFORNIA

Send us your catalog, "Profit From Presses" at once.
No cost. No obligation.

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**DIAMOND MULTI-MAX PUNCH PRESS
MODEL 5036 ILLUSTRATED**

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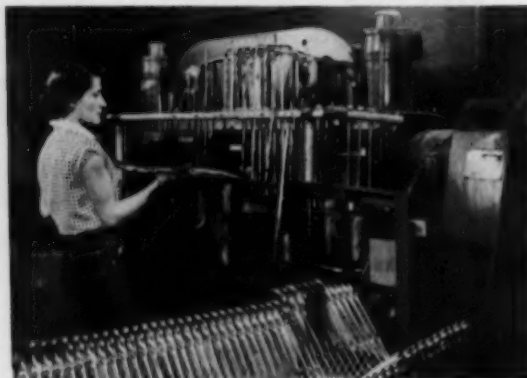
with long bed and ram areas illustrated in a new catalog, "Profit From Presses". Twenty pages with case history photographs such as illustrated below. Diamond Multi-Max punch presses are available in 30 and 50 tons capacity, 100 tons on special order. Six models for your selection. 24", 36", 48", 60", 72" and 84" working surfaces of bed and ram lengths. Air clutch and air brake at no extra cost. Mail in above coupon for your copy of this catalog, or write on your letterhead.



SALES AND SERVICE IN ALL PRINCIPAL CITIES



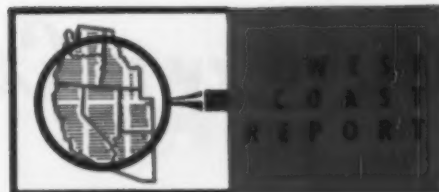
KWIKSET LOCKS, INC., ANAHEIM, flash trimming "Zamac" zinc alloy casting in the manufacturing of trim hardware for automobiles. Multi-cavity dies are used for flash trimming multiple parts at each stroke. The press has a 5" stroke for working clearance to remove parts.



ELECTROWELD STEEL CORP., AZUSA, piercing, forming, and crimping 1 1/2" 18 and 16 gauge tubing for dinette chrome furniture. The permanent setup of these three dies over the long bed area of the press eliminates down time in changing dies.



DIAMOND MACHINE TOOL CO.
PICO, CALIFORNIA



Accent On Expansion In Mountain States

Nation's leading source of mineral wealth still boosts untapped resources . . . Nonferrous industries among the leaders in increased area activity . . . transportation facilities good—By R. R. Kay.

How are your sales in the intermountain-market? Are you getting your full share?

Metalworking's growing fast—indications are for a very big future. The accent is on industrial expansion in Utah, Colorado, Montana, Idaho, and Wyoming.

Nonferrous metals and non-metallic minerals are in for big development. Anaconda Aluminum Co. just started its 60,000 ton annually, \$65 million primary aluminum plant at Columbia Falls, Mont. (IRON AGE, Aug. 18, 1955, p. 40.) And there's a good chance that Salt Lake City or Denver will get Boeing Aircraft's \$100 million, 20,000 employee guided missile plant.

Markets . . . You'd do well to look over the area carefully if your products or services are for these fields: mining, milling, smelting, refining, ferrous and nonferrous, metal fabricating, chemical, and petroleum industries. The country's greatest concentration of nonferrous mills and smelters is in the area. New since World War II: aluminum, tungsten, cobalt, molybdenum, uranium development. More metalworking plants are sure to come as the region develops.

Natural Resources . . . Untapped riches in minerals, chemicals, and oil hold big promise for the future. Only 38 minerals are now produced commercially—area has over 200.

Working mines, some 300 of them, extract: iron ore, lead, zinc, silver, tungsten, cobalts, molybdenum, vanadium, uraninite, ozocerite, elaterite, gilsonite, gypsum, and gold.

Here's more of what's going on: Utah produces 30 pct of the nation's copper and huge low-grade copper ore reserves still lie untouched. Oil is gushing in Colorado, Utah, and Wyoming: production tripled. The country's eyes are on the Colorado plateau. It has the largest proved uranium reserves in the nation.

Production . . . Metalworking plants are jumping—now eat up over 250,000 tons steel per year. In 10 years they tripled in number, payroll and annual sales. They make: Trusses, building frames, guard rails, bridges, storage tanks, pressure vessels, airducts, penstocks, corrugated pipe, boilers, ore buckets, truck bodies, fence posts, commercial trailers, food containers, tin cans, diamond bits, rock

bits, automotive springs, grates, irrigation equipment, mine cages and cars.

Important in this growth—and future growth—are the huge steel-producing facilities: Colorado Fuel & Iron Corp., Pueblo, Colo., with \$1.4-million-ton-per-year steel ingot capacity; and Columbia-Geneva Steel Div. of U. S. Steel Corp., Geneva, Utah, with 1.8 million tons.

Supplies of intermountain iron ore and cooking coal will keep the furnaces hot. 25 pct of U. S. Bituminous coal reserves are here—530 billion tons.

And look for nonferrous fabricators to cluster around primary metal plants. Despite the area's lusty primary copper production there's only a handful of copper fabricators. More will come.

Shipping . . . Market center for the intermountain states is Salt Lake City. Metalworking firms shipping from there have an important geographical advantage; its the same distance to expanding markets of the Pacific Northwest, San Francisco Bay area, and Los Angeles.

Southern Pacific railroad, San Francisco, will spend \$34 million for 185 diesel locomotives. They're for main line freight service. Orders went to: Electro-Motive Div. of General Motors; also Products, Inc., and Fairbanks Morse and Co. Delivery schedule starts November, ends May, 1956.

Pleasant living conditions with scenic country and fine winter sports into June mean the Mountain States will have little trouble getting and keeping the workers to support industry expansion.



"Let's not have any more of those dramatic excuses."

Efficiency in Cutting-off is Important

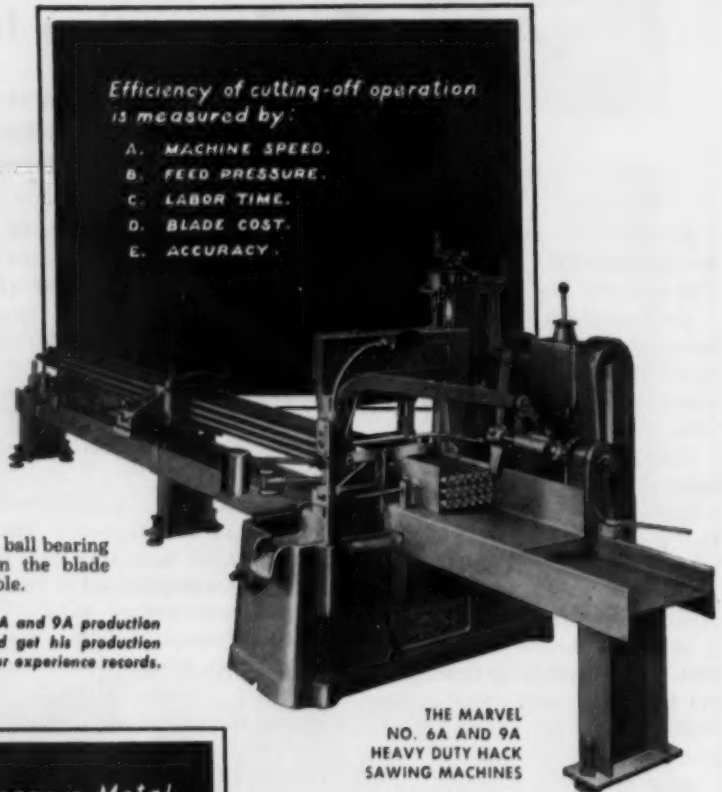
Practically all machining operations start with pieces cut-off from bars or billets. Hence, inefficiency, or lack of capacity, in the cut-off department can hold up or stagnate the entire plant.

- A. Are all-ball-bearing and provide a quick return; therefore they run **FASTER** than others on the same work.
- B. Can apply as much as 1200 pounds feed pressure—two to ten times as much as other hack saws and band saws.
- C. Are fully automatic, requiring no more operator attention than an automatic screw machine; and set-up for any bar size and cut-off length is extremely simple.
- D. Use a non-breakable high speed hack saw blade—the type of saw blade that produces the greatest number of square inches of metal cut per dollar of blade cost—two to ten times (or more) as much as any band saw.
- E. Because of their exceptional sturdiness, ball bearing reciprocating frame, ability to tension the blade "truly taut", their accuracy is dependable.

If you are not using modern, improved MARVEL NO. 6A and 9A production hack saws, call the local MARVEL Field Engineer and get his production and cost estimates on your work—to compare with your experience records.

Efficiency of cutting-off operation is measured by:

- A. MACHINE SPEED.
- B. FEED PRESSURE.
- C. LABOR TIME.
- D. BLADE COST.
- E. ACCURACY.



THE MARVEL
NO. 6A AND 9A
HEAVY DUTY HACK
SAWING MACHINES

Formula for Accuracy in Metal Sawing:

$$ACCURACY = \left(\frac{\text{Length}}{\text{Straightness} \times \text{Squareness}} \right)$$

$$\left(\frac{\text{Straightness}}{\text{Squareness}} \right) = \left(\frac{\text{Blade Rigidity}}{\text{Blade Tautness}} \right)$$



Write for catalog C-53—showing and describing eleven different series of Metal-Cutting Sawing Machines and MARVEL-High-Speed-Edge Hack Saw Blades and Hole Saws.

The composite MARVEL High-Speed-Edge Hack Saw Blade—cuts any machinable material efficiently. There is no time lost changing blades for different types of steel; no time lost replacing shattered blades, because MARVEL High-Speed-Edge Hack Saw Blades are positively **unbreakable**. These superior blades have the finest high speed steel cutting edge welded to a strong alloy steel body. They will stand-up under the highest speeds and heaviest feeds attainable on any make hack saw. Can be safely tensioned tauter than any other blade—cut-off not only straight but also square and with less stock loss.



ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

Here's the Rectifier That Needs



What Happened at the Chicago Show?

More than 100,000 came . . . Strong buying interest leads builder to predict doubled order backlog . . . General prosperity, excitement over automation were big factors in success—By E. J. Egan, Jr.

◆ NO DOUBT about it, the 1955 Machine Tool Show and companion Production Engineering Show were outstandingly successful.

Preliminary estimates put total registration at the International Amphitheatre and Navy Pier in Chicago comfortably over the 100,000 mark. This compares with approximately 75,000 registrants for the 1947 Show which was also held in Chicago.

But crowd size at the 12-day display of the latest in metalworking machines and techniques tells only part of the story. Buying interest is what really counts, and this year it was far ahead of that noted eight years ago.

The board chairman of one major lathe-building firm said he'd "never expected to see anything like this." Solid inquiries and responsible promises to buy were so numerous at his company's booth that he confidently expects the firm's order backlog to double between now and the end of the year.

Why the Interest . . . Why the heavy buying interest? Most builders come up with a three-point answer:

(1) They're not competing with huge stocks of government-surplus equipment as they were in 1947;

(2) Since the term "automation" didn't exist eight years ago, there was no curiosity about it. Now it's a household word and has everybody excited;

(3) The current business boom is encouraging heavier buying for replacement and expansion.

Builders of more specialized equipment aren't in quite the same position as their general-purpose fellow builders when it comes to reaping an immediate sales harvest from the Show. Single-purpose machines must be built to order, take considerable planning and negotiating before they go "on the books." But 1956 prospects for builders of these mass-production tooling setups had company executives smiling happily from the day the Show opened.

See Broad Interest . . . Buying interest at the Show fell into three distinct classifications. One group showed consistent curiosity about the latest in high speed automated equipment for mass production.

Another crowd segment concerned itself primarily with the automatic features of general purpose tools which could speed up short and medium-run metalworking operations.

The third area of buying interest centered on less automatic types of standard equipment that would handle the intermittent work typified by tool room and maintenance jobs.

As was expected, the automotive industries' production and engineering executives made a beeline for anything that showed the earmarks of automation — built-in gaging and feedback systems; automatic loading, positioning and transfer devices.

Production problems involved in the switchover to 1956 model automobiles apparently didn't keep these men at home.

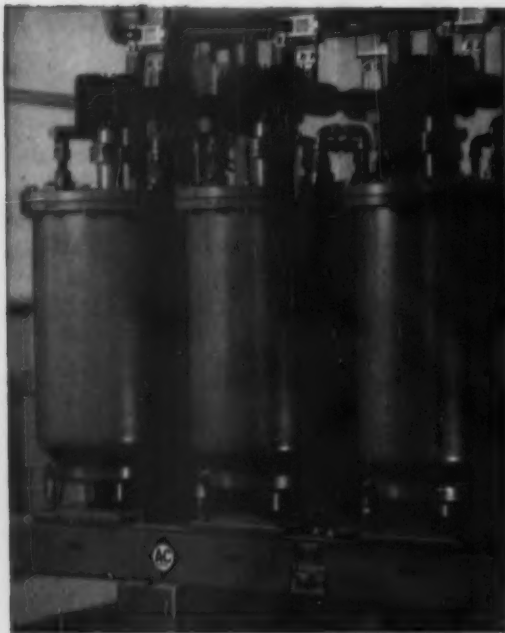
Speed Draws Crowds . . . In the short and medium-run metalworking areas, production men crowded around anything that exhibited a combination of high speed, accuracy and automatic cycling. Typical of this was the situation at the booth of a large radial drill manufacturer. Big feature here was a programming accessory that can be preset to actuate the best speed and feed combinations for an entire series of drilling, tapping or counterboring operations.

On this machine the operator is only required to position the work and make quick tool changes. With tool and workpiece ready for action, the operator punches a "start" button. The tool does its work at the speed and feed preselected by high authorities.



NEW PRESIDENT of National Machine Tool Distributors Assn. is Henry R. Hanson, vice president of William K. Stamets Co., Cleveland.

Here's the Rectifier That Needs No Delicate Adjustments



This 1000-kw, 6-tube excitron rectifier is typical of units used for heavy-duty service in many industrial plants.

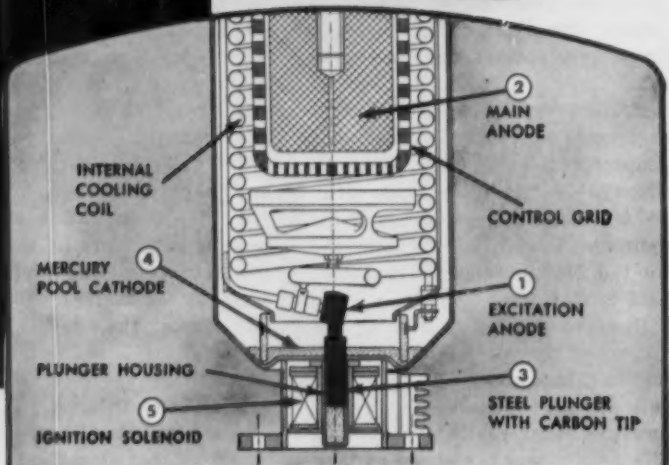
LITTLE MAINTENANCE IS NEEDED with Allis-Chalmers excitron-type rectifiers. Excitation of the excitron rectifier is continuous, while other types of rectifiers require re-ignition 60 times a second.

Since it is more difficult to start a rectifier arc than to maintain it, the excitron rectifier is much less likely to lose excitation during operation. Momentary dips in supply voltage which are encountered in many supply systems have no effect on the continuous excitation arc.

Years of operation in hundreds of installations have proved the reliability and ease of operation of Allis-Chalmers mercury arc rectifiers. You can get complete information from your nearby A-C office. Or write Allis-Chalmers, Milwaukee 1, Wis.

A-4581

ALLIS-CHALMERS Mercury Arc Rectifiers



Unique Plunger Starts Continuous Excitation

The excitron tube has an excitation anode ① in addition to the main anode ②. With the excitation circuit de-energized, the steel plunger ③ floating in the mercury pool cathode ④ makes positive contact with the excitation anode (as shown).

When the excitation circuit is energized, the ignition solenoid ⑤ pulls the steel plunger ③ away from the excitation anode ① and under the mercury pool cathode ④, thus drawing a dc arc and forming the cathode spot, which makes conduction of load current by the tube possible.

If power is interrupted the plunger will float up, contact the excitation anode and automatically re-establish the excitation arc when power is restored.

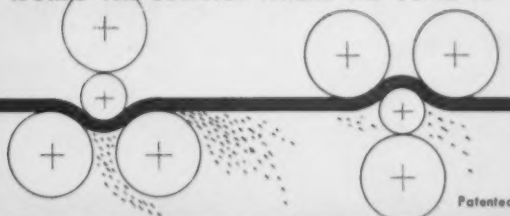
ALLIS-CHALMERS



UNITED.

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"WORKS THE SURFACE WHERE THE SCALE IS"



1. The only SCALEBREAKER in which the degree of scale-breaking can be varied.
2. Assures faster, cleaner, less costly pickling and better finished product.
3. Easily installed in existing pickling lines.

Write today for complete engineering data.

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ENGINEERING AND FOUNDRY COMPANY

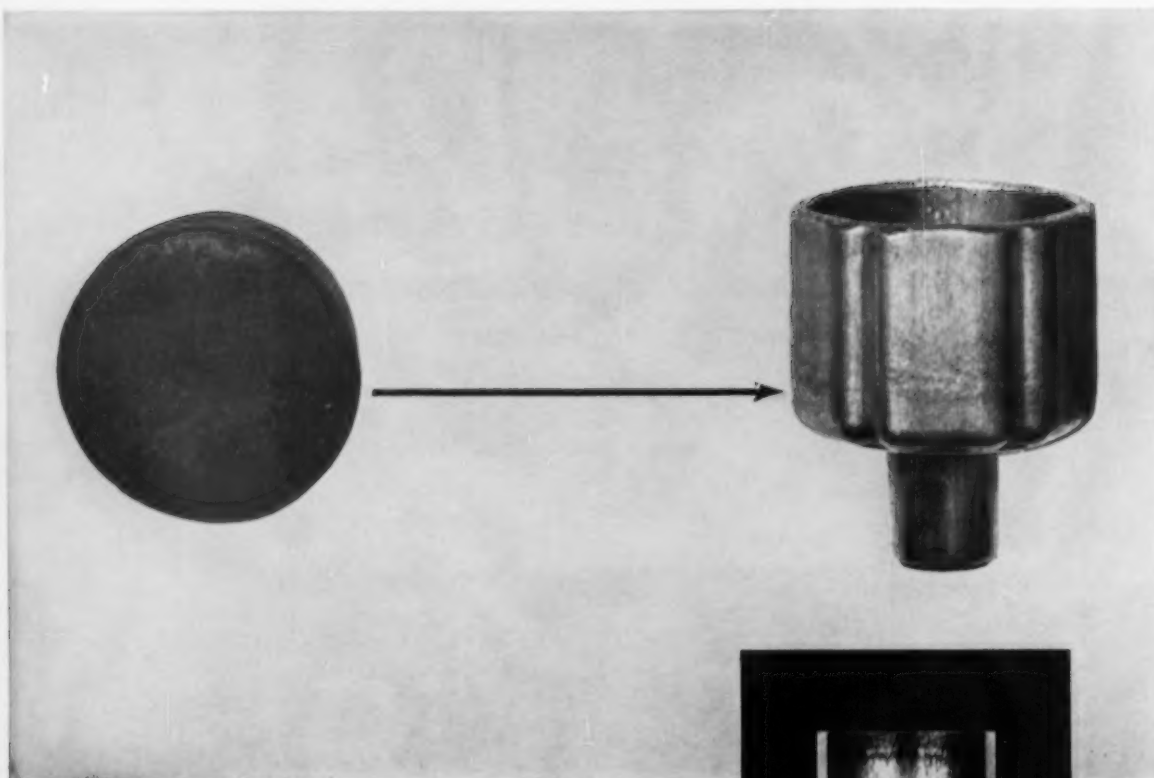
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Mills, Mill Rolls, Auxiliary Mill and Processing Equipment,
Presses and other heavy machinery. Manufacturers of Iron,
Nodular Iron and Steel Castings and Weldments.



COLD FORMED IN ONE OPERATION

—with Bonderite and Bonderlube!

An experienced production man looked at this blank and the formed parts and said flatly, "It can't be done!" But *it is being done* — in one operation — on a production basis of thousands of units per day.

The blank is treated with Bonderite, and then with Bonderlube. This combination works with remarkable effectiveness.

These two Parker products effect big savings in other ways besides raising production levels. Tool and die breakage declines sharply, fewer process anneals are necessary, operation is simplified, scrap is minimized, and machining operations are reduced.

Cold extrusion, with Bonderite and Bonderlube, may hold the key to cost-cutting for you. Write for information!

*Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.



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PARCO COMPOUND
rust resistant

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wear resistant for friction
surfaces

TROPICAL
heavy duty maintenance
paints since 1883



The Iron Age

SALUTES

Samuel M. Felton A man with a forward look and an easy way of getting things done, he has contributed to important rail car developments and worked effectively for the whole railroad industry.

A man who used to work with him said this about Sam Felton: "First off, I didn't know what to make of him. Then he started to get under my skin; I found I was doing things the way he told me. Finally, I wound up realizing he was smarter than any of us."

That's the way it is with the president of ACF's American Car and Foundry Division. Sam Felton is a big man. His son is the Olympic hammer thrower from Harvard and he stands well over six feet himself. He's a big man but he doesn't beat you down. "Charley," he'll say, "I know when you say something you've got the facts to back you up. That's why I'm asking you to handle this little job." And Charley will sure enough scramble around getting his facts straight.

What makes Mr. Felton's approach so effective, it springs from genuine confidence in others. He trusts others; he inspires confidence himself. Men put out for him. Best proof of all this is the way he's been able to get things done. He became president of Shippers' Car Line Corp., an ACF subsidiary, in

1950. Shippers' leases and sells tank cars. In Mr. Felton's time, lease service was snapped up through a 100 pct expansion of repair facilities. Five thousand cars were added to the company fleet and an all-steel car with dome and saddle pressed from one plate was introduced. Earnings to the parent concern increased sharply.

This June Mr. Felton was named president of American Car and Foundry Div. He spent three days just answering phone calls of congratulations. From Memphis to Mobile and points west, railroaders called in with glad words. Many of them had come to know Sam Felton through his work for the whole industry as head of the American Railway Car Institute.

Others remember how he pioneered streamlined trains as general sales manager of The Budd Company's railway division. During 10 years with Budd, he sold the first streamliner, brought in the largest order up to 1940. Older railroad men remember Sam Felton as the son and grandson of men who helped build the industry. He picked up where they left off.

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you'll find the answers to what's*

**NEW . . . IMPROVED . . . COST-CUTTING
. . . PRODUCTION BOOSTING!**

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Top interest sessions will help you do a better job of producing more at lowered costs!

● Industry's concentration of knowledge and experience in metalworking . . . will be on parade for you and your management, engineering, production and purchasing associates to see at Philadelphia Metal Show! Whatever your needs . . . from metals engineering to metal finishing . . . from design to testing and inspection . . . you'll find the quick, sure answers at the technical sessions of the Metal Congress . . . at the operating exhibits of the Metal Exposition. Don't miss it!



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National Metal Exposition and Congress...

**CONVENTION HALLS
PHILADELPHIA, PA.**

**OCTOBER
17 thru 21
1955**

The Iron Age INTRODUCES

W. D. Spaulding, elected vice-president, operations, Great Lakes Steel Corp., Detroit, subsidiary of National Steel Corp., Pittsburgh.

R. W. Grace, appointed manager of the Steel Works, Weirton Steel Co., Div. of National Steel Corp., Weirton, W. Va.

L. J. Wright, appointed assistant manager, primary production, and **M. E. Groat**, appointed superintendent of steel production, Great Lakes Steel Corp., Div. of National Steel Corp.

Lawrence Birdsong, appointed manager, Press Service Dept., Baldwin - Lima - Hamilton Corp., Hamilton, O.

R. P. Bremner, appointed manager of mining operations, Youngstown Sheet & Tube Co., Youngstown, O.

B. C. Kays, appointed purchasing agent for Northwestern Steel & Wire Co., Sterling, Ill.

W. L. Batten, appointed manager of Vanadium-Alloys Steel Co.'s Powder Metallurgy Dept., Latrobe, Pa.

R. C. Heacock, appointed director of engineering, Axelson Mfg. Co., Div. of U. S. Industries Inc., Los Angeles.

M. H. Atchley, appointed cashier of treasury division, Armco Steel Corp., Middletown, O.

G. R. McWane, joins American Crucible Products Co., Lorain, O., as plant engineer.

W. H. Niles, appointed vice-president of sales, East Coast Aeronautics, Inc., subsidiary Barium Steel Corp., New York.

H. W. Myers, appointed general sales manager of Globe Forge, Inc., Syracuse, N. Y., subsidiary of Barium Steel Corp.

A. H. Pope, appointed sales representative, Pennsylvania Salt Mfg. Co., Philadelphia.

B. G. Ebbeson, appointed district sales engineer, Norton Co., Worcester, Mass.

J. R. Round, joins the Cleveland district sales office of The Cold Metal Products Co., Cleveland, O.

W. J. Stasko, appointed sales engineer in Chicago district, E. W. Bliss Co., Canton, O.

L. E. Wing, named resident manager of new distribution center of The Goodyear Tire & Rubber Co. in Brook Park Village near Cleveland, O.

Anthony Alic, appointed assistant controller of Tractor & Implement Div., Ford Motor Co., Birmingham, Mich.

T. C. Smith, appointed manager of Boston sales district, Mercury Div., Ford Motor Co., Detroit.

G. E. McMahon, elected to newly created position of executive vice-president, Vulcan Containers, Inc., Bellwood, Ill.



H. J. WATT, elected president of The Canton Co., Baltimore and its subsidiary, the Canton Railroad.



C. E. LARSON, appointed vice-president in charge of research, National Carbon Co., Div. of Union Carbide & Carbon Corp., New York.



ANDREW DEANE, elected vice-president-materials, United States Steel Homes, Inc., Div. of U. S. Steel Corp.



J. E. GARNHART, appointed Chicago district sales manager, E. W. Bliss Co., Canton, O.



An Alcoa
Aluminum
Fastener
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used here !

It's an aluminum chair assembly, worth the lasting strength of Alcoa® Aluminum Fasteners. You avoid galvanic and atmospheric corrosion. You get perfect color match; you get the very highest quality product. Your local Alcoa distributor has a complete stock.

P. S. For this chair assembly, we suggest an aluminum machine screw, washer and nut from Alcoa's complete line of aluminum fasteners.



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2243-J Alcoa Building, Pittsburgh 19, Pa.
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Please send complete specification data
and samples of your aluminum fasteners.

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title _____
company _____
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Always Fasten Aluminum
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Aluminum Fasteners

J. H. Thompson, appointed special representative to the By-Product Coke Industry, Crusher Engineering Div., Poor & Co., Philadelphia.

F. A. Gaffney, appointed vice-president and general manager, Grand Trunk Western Railroad Co., Div. of Canadian National Railways.

Leonard Smiley, appointed manager of technical coordination, Atomic Energy Div., Sylvania Electric Products, Inc., New York.

A. J. Shivers, Jr., J. A. Brower, T. A. Sowin, appointed sales engineers for Philadelphia, New York and Chicago districts of Kinney Div., The New York Air Brake Co., Boston.

W. H. Crowley, appointed chief engineer, and **J. R. Marshall**, appointed equipment sales engineer, Kinney Mfg. Div., The New York Air Brake Co., Boston.

R. C. King, named to newly created capital equipment control office of Electric Boat Div., General Dynamics Corp., Groton, Conn.

T. J. Delaney, named director of advertising and sales promotion for The White Motor Co., Cleveland, and **R. A. Fryer**, named assistant director.

A. J. O'Brien, appointed to newly created position of vice-president and director of engineering and manufacturing, Gar Wood Industries, Inc., Wayne, Mich.

E. H. Mitchell, appointed field director, Gray Iron Founders' Society, Cleveland, O.

J. E. Unger, appointed administrative assistant to manufacturing manager of home appliance division, Servel, Inc., Evansville, Ind.

R. L. Carmichael and K. D. Hughes, appointed district sales managers for the Houston, Texas, and New York sales offices, respectively, Ramapo Ajax Div., American Brake Shoe Co., New York.

PERSONNEL



A. C. ERHARDT, JR., appointed director of sales, National Tool Co., Cleveland.



E. B. NELSON, appointed general manager, Coal Mining Div., United States Steel Corp., Pittsburgh.



J. H. WEISGERBER, appointed manager, advertising and public relations, Pittsburgh Steel Co., Pittsburgh.



J. L. HALLMAN, appointed manager, Marketing Div., Alan Wood Steel Co., Conshohocken, Pa.

THE IRON AGE



All abrasives look pretty much alike . . . but the way they perform is another story. Abrasive costs vary all over the lot. The only thing that doesn't change is the fact that Wheelabrator Steel Shot costs less to use than **ANY OTHER ABRASIVE**. It is the **KING SIZE BUY**.

Compare it to chilled iron. The savings are tremendous. Compare it to a malleablized abrasive. The savings are almost as great. Compare it to cut wire or to other steel shots. Wheelabrator Steel Shot still gives **KING SIZE SAVINGS**. It gives you these savings because it is produced to give **KING SIZE PERFORMANCE**. No other abrasive has such consistent hardness from pellet to pellet. No other abrasive has such uniform microstructure.

For **KING SIZE SAVINGS**, always specify Wheelabrator Steel Shot.

WRITE TODAY FOR BULLETIN 89-B

Wheelabrator® Steel Shot is Built for Peak Performance

- 1** Only Wheelabrator Steel Shot is produced to such exacting standards.
- 2** Only Wheelabrator Steel Shot is so carefully controlled for uniform quality.
- 3** Only Wheelabrator has such complete facilities for shot production.
- 4** Only Wheelabrator Steel Shot has a continuous pilot plant operation for research and development.

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CORPORATION

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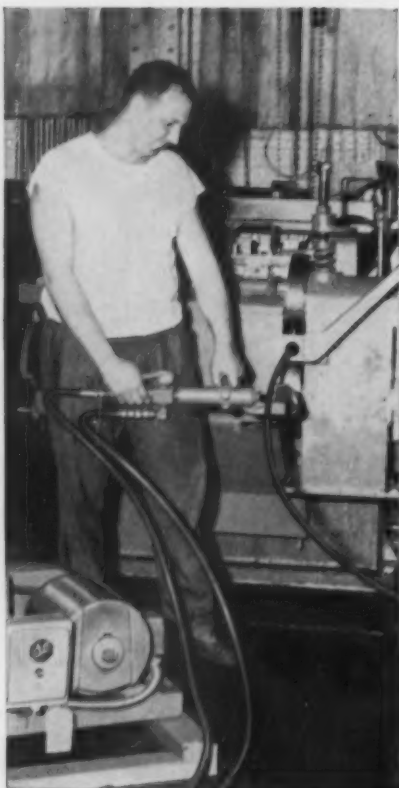
510 S. Byrkit St., Mishawaka, Indiana

Trail Blazer of Industrial Progress

September 22, 1955

97

MANCO GUILLOTINE HYDRAULIC UTILITY PRESS



Fast, easy to use, the Manco Utility Press can be operated by hand valve, as shown above, or by foot valve if desired.

10 Tons Thrust IN PORTABLE UNIT

Here is a highly versatile and powerful hydraulic utility press. Available with different yokes for punching, coining, straightening, riveting, swaging, etc. 2" stroke, $\frac{3}{8}$ " reach, $1\frac{1}{4}$ " daylight. Special yokes available to meet your requirements. Equipped with Manco 3 h.p. electric hydraulic pump. Weight of head, 18 lbs. The weight of the pump unit including motor is 300 lbs.



**NEW MANCO
GUILLOTINE CATALOG**
also available on complete
line of special hydraulic
tools for cutting, shearing,
punching, bending, riveting.



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- ☐ Bulletin on Utility Press
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Firm Name

Street

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PERSONNEL

J. E. Schuler, appointed field manager, Southern Div., Permacel Tape Corp., New Brunswick, N. J.

W. W. Watson, named director of purchases, Wagner Brothers Equipment Co., Detroit.

T. S. Bushnell, appointed mid-west district manager, Tube Turns Plastics, Inc., Louisville, Ky.

J. E. Shreve, appointed managing director in charge of marketing, Canadian Zurn Engineering, Ltd., J. A. Zurn Mfg. Co., Erie, Pa.

K. W. Patrick, appointed director of the Transducer Div., Consolidated Engineering Corp., Pasadena, Calif.

J. H. Quinn, Jr., joins TEMCO Aircraft Corp., Dallas, Texas, as chief of technical services.

J. R. Mathews, is now associated with Railway Equipment Div., Summer & Co., Buffalo, N. Y.

W. A. Sternad, appointed New Jersey representative for the Multi-Amp Corp., Newark, N. J.

D. B. Fraser, appointed manager of Cincinnati plant of ALCO Products, Inc., Schenectady, N. Y.

L. A. Patrick, joins Los Angeles sales staff of F. J. Stokes Machine Co., Philadelphia, as sales engineer.

A. A. Binkerd, appointed sales representative for Russell, Burd-sall & Ward Bolt & Nut Co., for the metropolitan New York-New Jersey area.

V. V. Netch, named manager of Welder Sales, Vickers Electric Div., Vickers Inc., St. Louis, Mo.

OBITUARIES

B. L. Cook, 47, district manager, Timken Roller Bearing Co., Pittsburgh.

A. G. Schuster, 64, structural engineer, The Rust Engineering Co., Pittsburgh.

J. A. Slater, 42, sales engineer, The Rust Engineering Co., Pittsburgh.

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**IMPROVE YOUR
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REDUCE COSTS

**ELIMINATE
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*"...every strapping application
should be reviewed regularly"*

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Name

Company

City State

September 22, 1955



SOCONY MOBIL



Correct Lubrication

FIRST STEP IN CUTTING COSTS

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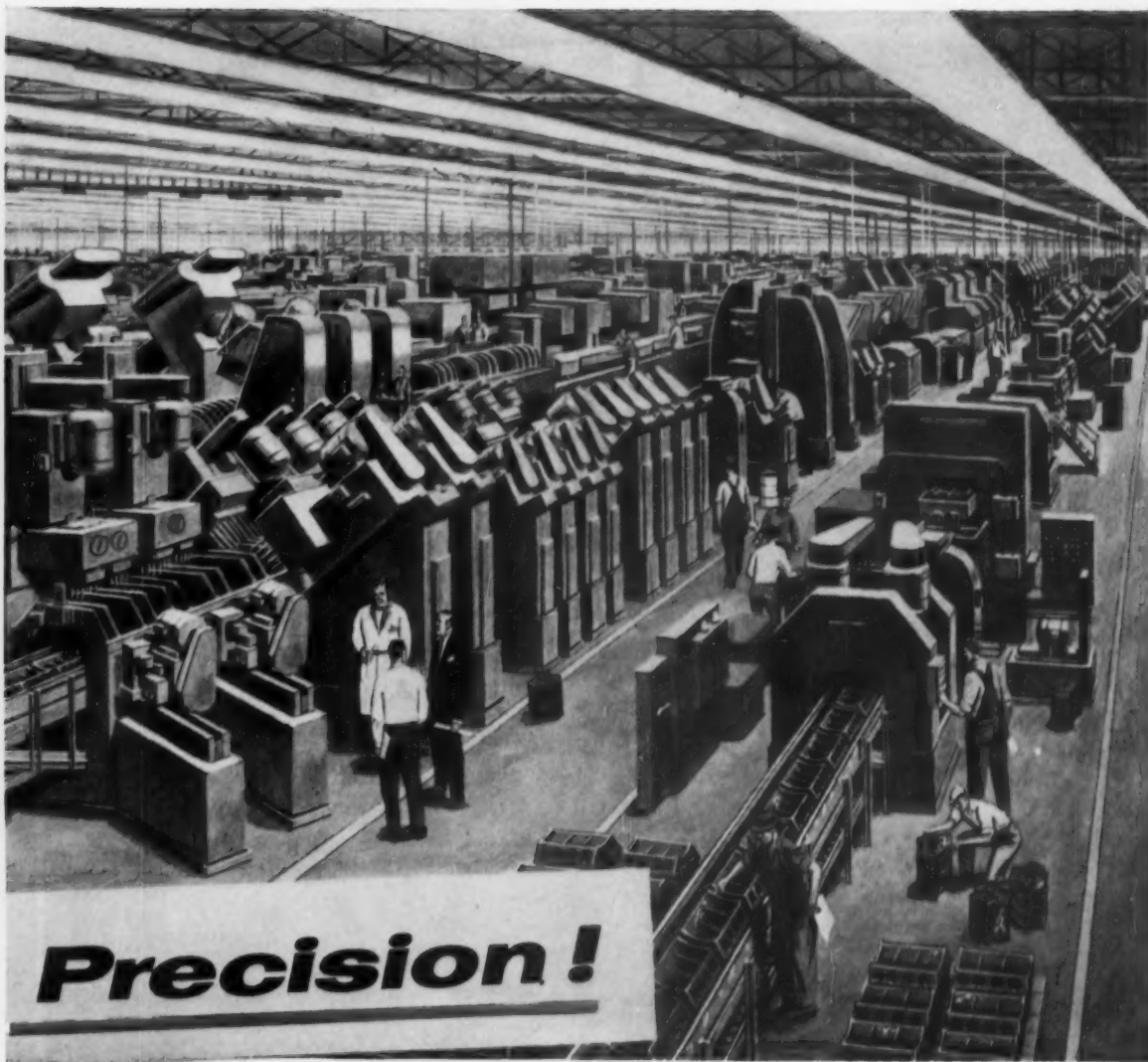
**"AUTOMATION" GIVES AUTO
AS CORRECT**



It was the fabulous automobile industry that popularized mass production a generation ago. Now, through the miracle of "Automation," this same industry is combining mass production with *mass precision* to produce better cars—for more people—than ever before possible.

Today, in leading plants, rough metal forgings and castings enter one battery of machines, are routed by automatic transfer devices to succeeding batteries of machines, and finally emerge as finished engine blocks, crankshafts, pistons, etc.

In one plant, for example, rough engine blocks pass at the rate of 100 an hour through 637 different machines and transfers, and come out—after some 1,000 separate machining and testing operations—finished to within tolerances of one ten-thousandth of an inch.



Precision!

INDUSTRY DRAMATIC BOOST BOTH IN QUALITY AND QUANTITY, LUBRICATION PLAYS EVER MORE VITAL ROLE

What Automation Is . . . This linking together of machines and transfer devices to obtain high precision finish of mass-produced parts is called "Automation." The many devices used to achieve this marvel of mass precision stagger the imagination. Electronic, pneumatic and hydraulic equipment controls the transfer of parts from one operation to another, positions each part for accurate machining, indicates when to change cutting tools, measures and sorts parts, pin-points trouble instantly should it develop. Even testing is done electronically, with parts automatically inspected at frequent intervals and ejected from the line if out of tolerance.



Correct Lubrication Vital . . . In all this maze of complex machinery there is one common factor of ever increasing importance. This is *Correct Lubrication*. For in Automation—more than in any other manufacturing

process—continuous, trouble-free operation and immediate response of every moving machine part spell the difference between success and failure. Should a single part of a single machine fail, it can bring an entire battery of machines to a standstill.



This is why so many leaders in Automation have entrusted their multi-million dollar plants to Socony Mobil—world leader in lubrication. In these plants, Socony Mobil engineers work continually with operators and machine builders through a program of Correct Lubrication to help keep production flowing smoothly—hold maintenance costs to a minimum.

Whatever your manufacturing process—whatever you make—you can get a similar program of Correct Lubrication started in your plant to help improve your production—cut your costs. Just call Socony Mobil.

**HIGH-SPEED
CONTINUOUS
PICKLING LINES**

Designed and Built by
MESTA



MESTA HIGH-SPEED CONTINUOUS PICKLING
LINES WITH TRIMMERS, UP-COILERS AND
MESTA-THOMSON FLASH WELDERS

*Designers and Builders
of Complete Steel Plants*



MESTA MACHINE COMPANY • PITTSBURGH, PA.

For overall savings—

How To Figure Your Industrial Truck Costs

♦ Tracking down the cost of owning and operating industrial trucks is not an easy job . . . But it will pay off in reducing overall operating costs . . . Realistic cost figures can tell you when to replace equipment, how much handling enters into the price of your product . . . They also locate high-cost handling areas and point the way to more efficient truck use.

By W. A. MEDDICK, Vice President
The Elewell-Parker Electric Co., Cleveland



FIXED-ROUTE system is often a good way to eliminate dead-heading and slash operating costs.

♦ **TWO IMPORTANT QUESTIONS** currently loom before cost-conscious materials handling men: (1) what makes up operating costs of industrial trucks, and (2) what to do about lowering them. While more and more companies are using powered industrial trucks to increase handling efficiency, far fewer firms can accurately measure the cost of operating these vehicles or realize the saving which can be made by more efficient operation.

Since considerable time and effort is needed to compute and record operating charges for industrial trucks, the question is often asked, "Why keep operating costs?"

In the first place, cost records make possible a comparison between truck and alternate handling systems. It is most important that such an analysis be completely impartial if the advantages of such a study be obtained.

Secondly, such figures are a great aid in deciding when to replace existing handling equipment. Some companies fail to review costs periodically. It may be that a given handling system proven the most economical at one time, has in terms of changing plant operations or the introduction of new types or variations of equipment, become less desirable.

A third reason for keeping operating costs is that they become a factor in computing overall plant operating costs for a finished product (or service in the case of warehousing). When computing the costs of putting a new product into production, in addition to dies, new machine tools, increased labor, and the like, the cost of handling the product during production as well as other phases, must be determined.

Check small factors

Fourth, such figures provide a means of overall cost cutting within the plant. When it is known precisely where certain costs exist, a more direct approach to minimizing such expense is possible.

Finally, in the case of industrial trucks specifically, such figures are often a positive means of determining which type of industrial truck, fork, platform, walkie, etc., should be specified for given handling jobs.

Major items to check in figuring the cost of truck ownership and operation are shown in the charts on page 105. The charts also point out that only proportional charges should be levied against certain equipment or departments where they have a bearing on other plant facilities or operations in addition to industrial trucks. This is most important in an accurate analysis of truck ownership costs, since a maintenance department, which services the trucks, may also be assigned maintenance jobs for other equipment.

Within the realm of truck operation, even the smallest factors should be noted because collectively they may add up to a considerable ex-



COST AND MAINTENANCE of pallets, skids or containers, essential to efficient truck use, must be considered a part of overall truck ownership.

pense. For example, it is quite common to figure gasoline as a cost of operating gasoline trucks. Yet, many firms overlook the cost of electricity in supplying current for charging battery-operated trucks.

With complete facts and figures available on the cost of owning and operating powered industrial trucks, what then are the steps to be taken to reduce these costs?

It is important that a company buys the best equipment possible for its specific requirements. Today, most firms realize that it is more economical to pay a higher price for equipment that will do a better job, cost less to maintain, and give better and longer service life. The same care in purchasing the finest and best suited industrial truck also holds true for pallets, skids, and other containers as well.

An effective preventive maintenance program can do much to lower truck operating costs. Through preventive maintenance, many minor troubles can be caught in time, thus preventing costly failures or breakdowns. The training of truck operators to spot such warning signs is vital to the success of the overall program. Regularly scheduled inspections and lubrications are also a must.

Aid inventory control

Proper records of maintenance functions go a long way toward insuring effective preventive maintenance. They also aid in the ordering and stocking of spare parts in proper quantities when needed.

Such records can also provide clues to a consistent trouble spot which when eliminated can sharply decrease truck repair. One company noted re-occurring axle damage to several of its trucks which operated in the plant yard. This factor, which came to its attention through a study of maintenance records, was traced to

Cost Checklist for Industrial Trucks

Operation Cost Factors	Remarks
1. Original Cost of Truck	
2. Allowance for Yearly Charge-Off	For Gas Trucks—7 years; for Electric Truck—12 to 15 years
3. Cost of Accessory Equipment	Batteries, spare batteries, charging equipment, gasoline storage facilities, pumps, oil storage facilities, etc.
4. Cost of Maintenance Department	Lubrication equipment, lifts, tools, tire presses, etc. NOTE: Where the same maintenance department is used for other plant equipment, only a proportional charge should be levied against truck operation.
5. Initial Cost of and Facilities for Two-Way Radio Systems	Where such equipment is used for other purposes, safety or plant protection for example, only a proportional charge should be levied against truck operation.
6. Cost of Pallets, Skids, Containers	Where such equipment is used with other handling equipment, only a proportional charge should be levied against truck operation.
Ownership Cost Factors	Remarks
1. Gas or Electricity	Figured at bulk rate at which company purchases it.
2. Oils, Lubricants, Hydraulic Fluids	
3. Operator(s) Wages, Wages of Their Supervision, Plus a 25 pct Increase for Fringe Benefits	Annual wages for industrial truck operators range from \$3600 to \$4200 per year.
4. Maintenance Cost of Pallets, Skids, Containers	With pallets, for example, approximately 18 pct of the original investment per pallet should be allowed for annual maintenance.
5. General Truck Maintenance — Preventive and Repair	
6. Wages of Maintenance Personnel, Wages of Their Supervisors, Plus a 25 pct Increase for Fringe Benefits	Where maintenance personnel perform functions for other equipment, only a proportional charge should be levied against truck operation.
7. Cost of Spare Parts Plus Materials and Supplies Used	
8. Cost of Operator Training Plus Materials and Supplies Used	
9. Cost for Specialized Equipment for Safe Operation of Trucks	Truck and load guards, warning lights, etc. NOTE: In some companies, such equipment may be charged to a plant's safety budget.
10. Overall Cost of Plant Overhead, Taxes, Insurance, Interest on Investment, etc.	

"One of the greatest nonproductive costs in truck operation stems from poor scheduling . . ."

a rutted crossing at a rail spur over which these trucks traveled many times each day.

The repair of this crossing completely solved the problem, an important cost savings to the company.

Actual repair work is also important in minimizing truck operating costs. Personnel should be thoroughly trained in their duties, high quality parts should be used, and an intelligent approach as to when to replace existing parts, are all essential to a correct repair program.

Operating training is vitally important in keeping trucks on the go, at the lowest possible cost. More and more companies are setting up formal driver training schools; other companies have insisted on less rigorous, yet effective driver training programs, which present actual courses that prospective truck operators must pass before they are allowed to start on the job.

Poor scheduling costs money

Direct cost savings are often traceable to such programs in terms of the reductions of accidents and the accompanying expense in damaged loads, trucks and other equipment, plus compensation claims arising out of injury to personnel.

One of the greatest non-productive costs in truck operation stems from poor scheduling.



PROPER RECORDS of maintenance functions go a long way toward insuring effective preventive maintenance. Here operator lubricates hoist motor.

This results in excessive travel without payloads (dead-heading). In the average company, only 60 percent usage is obtained from industrial trucks. When a concentrated effort is made to improve scheduling methods, up to 90 percent usage has been achieved.

Several methods may be employed to determine actual truck operation. One uses operational recorders which measure the amount of time the truck is in motion, with and without a load. Another way is to have operators keep an actual log of trips made, where loads were handled, etc. In any event, it is most important to review records, either mechanical or manually recorded, to determine where improvements can be made to increase truck usage, minimize dead-heading.

Fixed route system helps

With such information on hand, improved scheduling may result from the use of written orders, a light system for signaling trucks, the use of two-way radios, and other such methods and equipment. Some companies find that a fixed route system is the best way to eliminate dead-heading; others find that fixed area assignments is the best way.

A fixed route system involves setting up specific routes of travel for powered rolling equipment, most often tractor-trailer trains, usually operating on precise time schedules between departments. With such equipment providing the chief means of interdepartmental transportation, additional equipment is required only to transfer goods to and from nearby work stations and the pick-up or discharge point of the long range operating vehicles.

Fixed area handling involves laying out a plant according to prescribed areas, determining which equipment shall operate within these areas, and noting that no equipment shall travel outside these limits. Such a system is sometimes supplemented with several trucks which can take care of emergency or certain prescribed inter-area moves, but by and large, the majority of the vehicles operate locally, eliminating excessive dead-heading, reducing the length of individual moves.

Many firms have found that increased truck effectiveness can be obtained, in addition to proper scheduling, by having operators work on an incentive system on the basis of the type of loads handled and the overall work performed. It must be remembered, however, that such a system must be set up like any other standards system within the plant—that is, on a per job basis according to a preassigned rate for that particular job.

Powered industrial trucks have been recognized as the best of many material handling systems. The job of tracking down truck owning and operating costs is not always an easy one, but in all cases a vital one for reducing overall plant operating costs.

Pre-Finished Metals Combine Attractiveness With Savings

♦ Base metals pre-coated with surfaces that won't come off during fabricating processes are cutting costs on many familiar items . . . Manufacturers use these plated, dipped, lacquered or enameled finishes for numerous applications.

♦ Pre-coating can be combined with mechanical pre-finishing, such as embossing, perforating and brushing . . . Properties and uses of these ready-to-use sheet and strip materials are discussed and summarized to bring you up to date.

By J. B. MOHLER, Consultant, New Castle, Pa.

♦ **SIGNIFICANT SAVINGS** can often be achieved by using prefinished sheet or strip metal for product fabrication. Many standard grades of precoated ferrous and nonferrous material are available, moreover a number of producers are equipped to make special lots to order.

In prefinishing, the base metal may either be electroplated, hot dipped, lacquered or enameled. Still another form of prefinishing may involve planishing, buffing, crimping, embossing, expanding or perforating the base material. Some of these mechanical treatments may be applied in conjunction with surface coating processes.

Actually hundreds of combinations of prefinished strip are possible, considering the base metals, coatings, and undercoatings; plus the buffed and other mechanical finishes available. A coated surface generally requires more care in handling, but on the other hand it usually acts as a protective coating during storage and manufacturing.

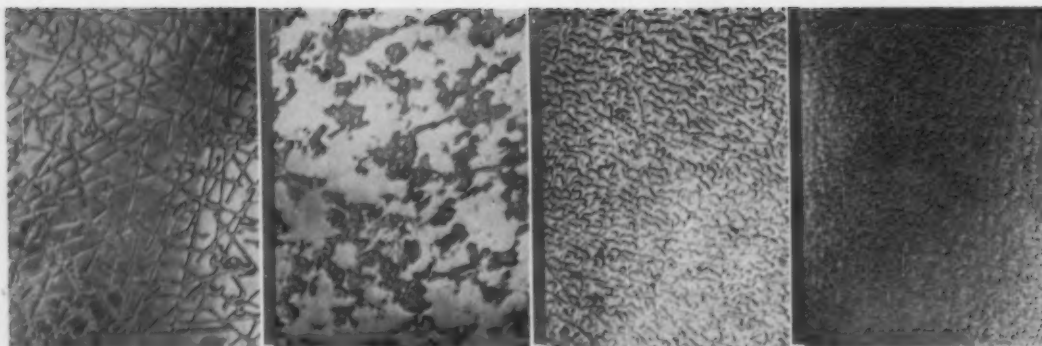
Although new production problems may be presented by the use of prefinished materials, these are frequently more than offset by the advantages.

Accompanying tables summarize some of the

properties and typical applications of sheet and strip material electrolytically coated with various finishes. Most of the coatings are used as final finishes although copper and brass surfaces are generally coated with clear lacquer to avoid tarnishing and to increase corrosion resistance. Copper coatings are often used as a precoat for additional plating; zinc and lead alloy surfaces frequently serve as a precoat for painting.

Soft metal coatings, such as copper, tin, or a lead alloy, are available on deep drawing steels. An accompanying photograph illustrates steps in the deep drawing of flashlight cases from copper-coated steel. In this instance the draw required could not be obtained from uncoated metal. The copper also provides a good case for the final chromium plating.

Referring to the table that shows the properties of typical electrolytic coatings on a number of base metals, some supplementary notes may be helpful. For example, where corrosion resistance is indicated to be poor, a clear lacquer coating is recommended. Also, although copper, brass and nickel surfaces are easily soldered, chromium coatings should be removed either by scratching or with hydrochloric acid prior to soldering.



EMBOSSSED designs may be combined with pre-coated finishes in many attractive patterns.

Cold riveting of these prefinished materials may be done in a normal manner, except that care must be taken not to mar the finished surface. However, hot riveting may cause oxidation. Spot welding works successfully on these finishes, but the heat from gas welding may destroy the plated surface.

In blanking precoated metals, the finished surface must be considered. Tools and dies should be checked for rough edges and kept clean. Lubrication with three parts of S. A. E. 20 oil to one part of kerosene has been found satisfactory for blanking. Emulsified oils containing water may cause corrosion if allowed to remain on the work.

Although ductility of the base metal is reduced about 10 pct by nickel and chromium plating, such materials are being deep drawn successfully. Soluble oils are satisfactory for lubrication if the parts are cleaned and dried after drawing to prevent staining.

Bending pre-finished metal also requires that forming tools be checked for nicks and rough edges. And since plated metal has more spring-back than unplated material, allowance should be made in aligning forming dies.

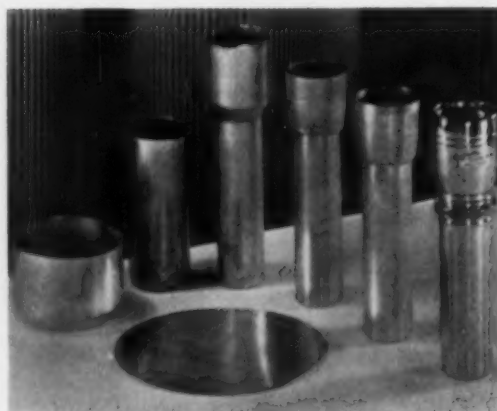
To protect the coated surfaces during blanking, forming, bending and drawing operations, prefinished metals are available with either a removable pressure sensitive paper or a stripable plastic coating.

Roll in designs

Composite prefinished coatings are used for many applications where a design is produced by etching away part of the surface.

In the area of mechanical prefinishing, embossed designs are often rolled into coated strip material to produce decorative patterns. These are available in standard finishes and can be fabricated by customary methods. Crimped sheet and patterns, consisting of alternate stripes or diamonds of dull and polished bands, are also available.

Perforated sheet is used extensively, but the



COPPER coating on steel aids drawing of flash-light cases, provides base for chrome plate.

uncoated variety may cause heavy wear and tear on mechanical finishing equipment. Buffing this type of sheet often results in wear of the pattern and uneven surfaces. Consequently finishing costs tend to be lower and quality more uniform if prefinished sheet is used. For fabricating or forming perforated metals, a paper or plastic coating help prevent surface scratching. Since perforating is done on a sheet basis any of the prefinished coatings can be obtained.

Expanded metal is a lightweight, strong material frequently specified where free passage of light and air are important. It is used for structural and reinforcing applications, in panels, guards, shelving, enclosures and walkways. Additional uses include component parts (often decorative) for refrigerators, radios, cabinets, laundry equipment, sorting machinery, and industrial devices.

Expanded metal is not manufactured from prefinished sheet, but in addition to low carbon steel forms available, it can also be had in stainless steel, aluminum, monel, and inconel. In the corrosion resistant grades it is often used

Typical uses of pre-finished sheet and strip

Coating	Undercoat	Base Metal	Typical Uses
Chrome	Nickel	Zinc	Trim, Moldings, Signs, Stampings
Nickel	.....	Zinc	Eraser Disc, Tags, Emblems
Copper	.....	Zinc	Moldings, Decorative Trim
Brass	.....	Zinc	Inlays, Ornaments, Badges
Chrome	Nickel-Copper	Steel	Electrical Appliances, Heater Parts
Nickel	Copper	Steel	Toys, Brush Ferrules, Nameplates
Copper	.....	Steel	Display Stands, Trim, Reflectors
Brass	.....	Steel	Trim, Frames, Luggage Hardware
Chrome	Nickel	Brass	Nameplates, Automotive Specialties
Nickel	.....	Brass	Fish Lures, Battery Clips
Chrome	Nickel	Copper	Electrical Devices, Signs
Nickel	.....	Copper	Washing Machine Parts
Chrome	Nickel	Aluminum	Stampings, Toys, Trim
Nickel	.....	Aluminum	Lighting Fixtures, Stove Parts

without further finishing, although for truly decorative purposes it is usually painted or plated.

Where a permanent metal finish is desired to resist corrosive and abrasive conditions, such as outdoor exposure, either polished stainless steel or aluminum sheet is frequently used. If the surface should become scratched or marred it can be restored by polishing without loss of protective value. Where heavy sheets are required for some type of construction, carbon steels clad with stainless steel or monel offer a cost advantage.

The history of prefinished steel really started with tinned and galvanized sheet. And for manufacturing low cost, high-volume items, these mass tonnage products should not be overlooked. Electro deposited tin and zinc coatings are free from brittle bonding layers and are thus used on deep drawing stock.

Zinc coated steel sheets are used for a wide variety of products including home freezers, meter boxes, screen frames, beer coolers, ventilators, drying equipment, cabinets, shelving, and license plates.

Heat and corrosion resistant aluminum-coated steel sheet is used for dryers, baking pans, stove parts, space heaters, inner toaster parts, water heater components and other indoor and outdoor applications.

General Properties of pre-finished sheet and strip

Coating	Nickel or Chrome	Nickel or Chrome	Nickel or Chrome	Nickel or Chrome	Nickel or Chrome	Brass or Copper	Brass or Copper
Base Metal	Steel	Zinc	Brass	Copper	Aluminum	Steel	Zinc
Spot Welding Properties	Good	Poor	Fair	Fair	Fair	Good	Poor
Soldering Properties	Good	Good	Good	Good	Good	Good	Good
Stamping	Drawing	Good	Fair	Good	Good	Fair	Good
	Blanking	Good	Good	Good	Good	Good	Good
Bending and Forming	Good	Fair	Good	Good	Good	Good	Fair
Corrosion Resistance	Salt Air	Poor	Poor	Fair	Fair	Fair	Poor
	Outdoor	Fair	Fair	Good	Good	Fair	Fair
	Indoor	Good	Good	Good	Good	Good	Good
Etching Properties	Good	Good	Very Good	Very Good	Good	Fair	Fair
Tempera	Soft to Hard	Soft to Hard	All Tempers	Soft to Hard	Soft to Hard	Soft to Hard	Soft to Hard
Resistance to Heat	Continuous Service	800	150	300	300	500	175
	Intermittent Service	800	200	400	400	500	200
	Chrome	1000				Chrome	1000

Lacquered and enameled metal strip is available in many attractive colors. And lacquered coatings over bonderized, zinc-coated steel can be readily formed and drawn.

ACKNOWLEDGMENTS

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RADIO design uses expanded metal for protection, decoration and free sound passage.

Solderability: Many Factors Affect Joint Quality

♦ Solderability is a function of every factor which affects joint quality . . . In another sense, it's the ease with which solder will flow on metal . . . In either case, wetting of the base metal is required.

♦ Other factors—temperature, time, capillarity, surface roughness of base metal—all exert a strong influence on solderability . . . Major difficulty lies in simulating production conditions in test programs.

By HARRY SCHWARTZBART,
Research Metallurgist, Armour Research Foundation, Chicago

♦ JOINING METALS by soldering dates back to ancient times—and modern metalworking industries depend on it extensively. Yet the factors which govern soldering, and particularly solderability, are not too well understood.

The ease with which two pieces of metal may be soldered varies with the material, filler metal composition, flux and a number of other factors. But a requisite of a successfully soldered joint is that the filler metal must wet the parent metal.

In a very broad sense, solderability is a function of every factor which affects the quality of a soldered joint. Thus, a given system of solder, flux and parent metal under a given set of soldering conditions may be said to possess good solderability if a satisfactory joint results, or vice versa. Standards for evaluating joint quality may be on the basis of strength, corrosion, appearance, permeability or electrical conductivity.

In a more limited sense, solderability denotes the ease with which a solder will flow on a solid metal. It may or may not imply the presence of a capillary. But even in this more limited sense, solderability is a function of many factors.

Under these circumstances, it is difficult to devise solderability tests which will predict behavior in production soldering. The problem, therefore, is the common one of having to

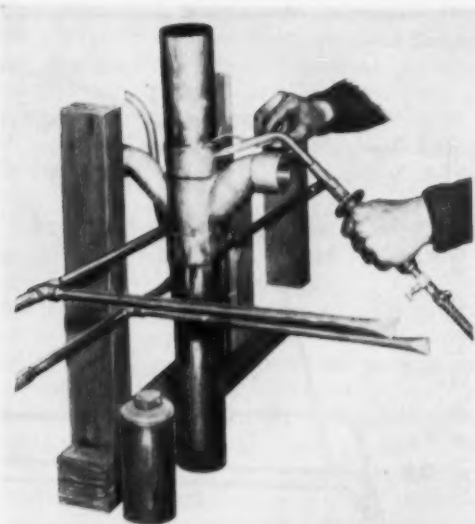
simulate production or service conditions, or knowing the relationship of test conditions to production conditions.

The combination of base stock, filler metal and flux may be designated as the soldering system. To produce sound soldered joints, the solder must wet the base stock. To do this, the base stock surfaces must be clean and free of oxide. Removal of oxide is accomplished by use of a flux which also prevents oxidation during heating. This is easily done with some materials as tinplate and copper, but is more difficult with materials as stainless steel and aluminum.

Wettability is complex

Wettability in soldering systems is a complex property and is possibly dependent on diffusion, viscosity of solder and flux at the soldering temperature, surface tension, contact angle and the presence of surface oxides on the molten solder. The soundest soldered joints result where there is mutual diffusion between solder and stock.

The extent of the diffusion will determine the actual phases present and their amounts, and for any system there may be an optimum amount of diffusion. In fact, a drop of molten metal spreading on a solid metal surface is sometimes preceded by a sort of halo which indicates that surface diffusion may well be an



ONE REQUISITE for a successfully soldered joint is uniform and sufficient heating so that the solder does not freeze before filling the joint.

important factor in determining wettability.

One series of tests¹ in which 38 pairs of pure metals were investigated showed that wetting occurred in those systems where either intermetallic compounds or solid solutions were formed. However, no wetting occurred in those systems in which no compounds or solid solutions were formed.

An optimum amount of intermetallic compound formation is necessary for the best tin-lead soldered joints. If excessive time is allowed at soldering temperature, too much intermetallic compound may form and the joints may be brittle.

It is generally assumed that some diffusion is necessary to form strong joints, but this is not so. Lead failed to wet copper and iron, but the adhesion was strong when it was allowed to solidify in contact with either. Furthermore, pure silver-brazed butt joints have been obtained in mild steel² that had a strength of 67,000 psi, yet iron and silver are practically insoluble in one another.

There are several specific temperatures relevant to the success of a joint in any given soldering system. These are: (1) melting point of the flux, (2) solidus of the solder, (3) liquidus of the solder, (4) temperature of the work when solder is applied, and (5) temperature of the solder when applied to the work.

Since one function of the flux is to protect the base metal surface from oxidation, the flux must melt at a temperature low enough to begin functioning before the stock oxidizes. On the other hand, if the melting point is too low, the flux will become saturated with oxides and lose its activity before the soldering operation is completed. In addition, upon cooling

the flux, which now has a different composition than upon heating, must not solidify until all the solder has solidified. Otherwise, there is danger of flux entrapment which leads to weak joints.

Between the solidus and liquidus temperatures, the solder is in the plastic range. This range is useful in wiping solders and in soldering parts which require adjustment in fit-up as they cool. The temperatures of the solder and work when the two are brought together are important because the work should be at a temperature above the melting point of the solder throughout the entire joint.

Sometimes, the only source of heat is the molten solder. For this reason, it is heated to from 30° to 100° F above the liquidus. In other cases, as in making connections in wires with a hand soldering iron, there should be enough transfer of heat to melt the solder.

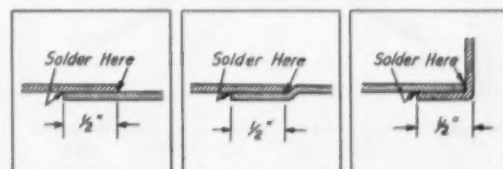
Another complication is that the solder must traverse a given distance, possibly through a capillary. Heat will be extracted from the solder as it travels. Therefore, heat input must be sufficient so that the solder will not freeze before it has completely filled the joint.

Time is another important variable in soldering operations. Wettability is very much dependent on time due to the role of the forces of diffusion, chemical reaction and flux activity. The useful life of a flux is finite rather than infinite, relative to the time required for soldering. Hence, data obtained from laboratory tests of long duration may bear little relation to high-speed soldering operations.

Determine solderability effect

Some tests³ have been made to determine the effect of the establishment of capillary contact on solderability. Pellets of lead, tin and 40:60 tin:lead were melted in contact with a capillary in copper sheet. All three compositions penetrated the capillary equally well.

When pellets were placed 1/32 in. away from the capillary, the lead and tin never established capillary contact after melting and, therefore, never filled the joint. The tin:lead alloy immediately upon melting collapsed into a compact drop, then spread until it touched the capillary opening and was thereupon drawn into the capillary. Thus, joint design, solder placement and gravity are important factors



THREE VARIATIONS of a lap joint show the possibilities in design which are adaptable for soldering with either a torch or soldering iron.

in determining whether a joint can be soldered successfully.

Surface roughness of metals to be soldered has an influence on wettability. This effect has been studied theoretically.^{4, 1, 5} In another study, copper has been prevented from wetting steel by polishing the steel.⁶ Other studies⁷ have dealt with the effect of roughness on the spreading of silver on iron. Sometimes, difficulties in soldering or brazing highly polished metals can be overcome by roughing them with emery paper.

The mechanism through which surface roughness aids wettability is probably by the capillary force exerted by interlacing. The nature of the roughness determines its effect.^{1, 3, 8} Thus, interlacing grooves have one effect, but a series of pits having the same surface area will have an entirely different effect.

Test joint strength

A number of other factors which influence solderability do exist, but exactly what they are and how they operate is still unknown. Two such cases involve galvanized steel and tinplate. In one application, no difficulty was encountered in soldering hot dip galvanized steel to brass, but electro-galvanized steel plated from an alkaline cyanide bath soldered to brass yielded weak joints. This occurred even when the zinc plates in the two cases were of equal thickness. Yet, electro-galvanized steel plated from an acid bath and soldered to brass yielded joints comparable in strength to those with hot dip galvanized steel.

Various tests have been used to study solderability. A common method of evaluation is to make a soldered joint, usually a lap joint, between two pieces of strip under closely controlled soldering conditions. The joint is then pulled apart, using strength and appearance as criteria of joint quality.

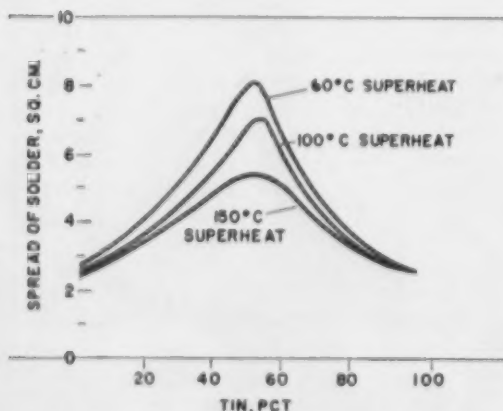


FIG. 1—Spread of lead-tin alloys on high conductivity tough pitch copper is plotted as a function of tin content.

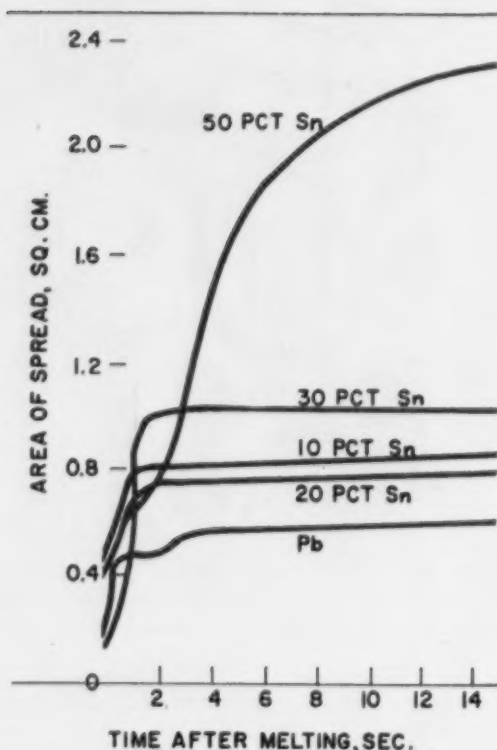


FIG. 2—Spreading of various solders on oxidized copper, using a tin-bearing flux.

Such a test is valuable for screening purposes, but it is subject to experimental error and often lacks resolving power to differentiate and evaluate various solders and soldering systems. If the test is used, care must be taken to control closely temperature, method of solder application and speed of soldering.

Another common method of evaluating soldering systems is to measure the area to which a pellet of solder spreads when melted on a given metallic surface in the presence of a given flux. Details of this test may vary, but the general scheme is widely used in both fundamental studies and in screening for production purposes.

In still another test,⁸ 1½-in. square plate specimens were placed on a copper block which was heated from below by gas flame to a specified temperature. Each specimen was fluxed with 0.1 cc of DTD 81 flux and held a disk of solder 8 mm in diameter and 0.1 cc in volume. Total heating was 1½ minutes. The solder began to melt in 10 seconds and spreading stopped in another 50 seconds. After removal from the copper block, solidification, cleaning and drying, the area of spread was measured with a planimeter.

Typical results for tin-lead solders on copper are given in Fig. 1. Area of spread is plotted as a function of tin content. Since liquidus

temperature is a function of tin content, the data are reported for constant amounts of superheat (temperature interval between liquidus and test temperatures). The greatest area of spread for tin-lead alloys on copper occurs at a tin content of about 50 pct. The area of spread decreases with an increasing amount of superheat.

Two principal deficiencies exist in relating the area of spread test to production soldering behavior. First is the absence of a capillary which is generally present in production soldering to help distribute the molten solder. Secondly, time is generally in excess so that the test does not differentiate between two systems in which the solders spread to the same area but at different rates.

The time factor is an important one since different soldering operations require different periods to effect a joint. The effect of time on the spreading of tin-lead solder pellets on copper is illustrated in Fig. 2. The solders reported differ in merit depending on the time after melting.

Measure travel time

Measurements have been made of the time required for solders to travel the length of a horizontal capillary 4 in. long by $\frac{1}{2}$ in. wide.⁹ Data for tin-lead solders in copper capillaries 0.0035 in. thick are given in Fig. 3. If soldering behavior is to be determined by the time required to travel the length of a capillary, the conclusions drawn will differ from those of the area of spread test.

Pure tin is superior to any other composition shown in Fig. 3. It also shows that there is practically no difference between pure lead and 50-50 solder, and that the higher the superheat the lower the penetration time. This is in sharp contrast to the data in Fig. 1. In using evaluation tests, the various factors in actual soldering must be considered.

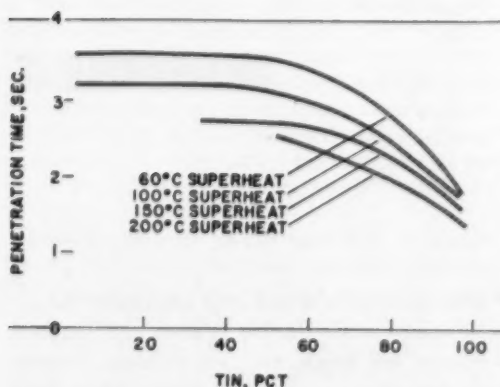


FIG. 3—Penetration times for tin-lead alloys in high conductivity tough pitch copper joints 4 in. long by $\frac{1}{2}$ in. wide by 0.0035 in. thick.

The effect of capillary spacing on penetration time is presented in Fig. 4. The ordinate is the inverse of the penetration time, and the finer the capillary the longer the penetration time. Actually, there must be an optimum joint spacing for fastest penetration since beyond a certain spacing capillary force will not be obtained. Optimum spacing will depend on design and solder placement.

Some evaluation tests are used in which the height to which solder will climb in a vertical capillary in a given time interval is measured. One such test uses a pair of twisted wires dipped into molten solder. The separation between the twisted wires serves as the capillary and the height of climb after 15 seconds is measured.

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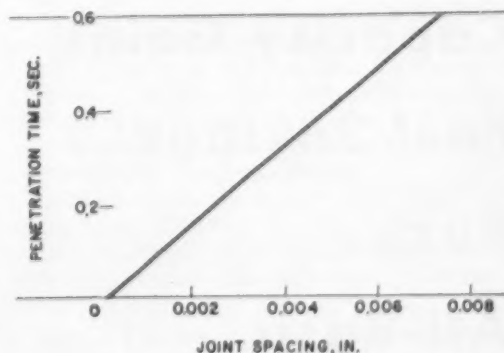
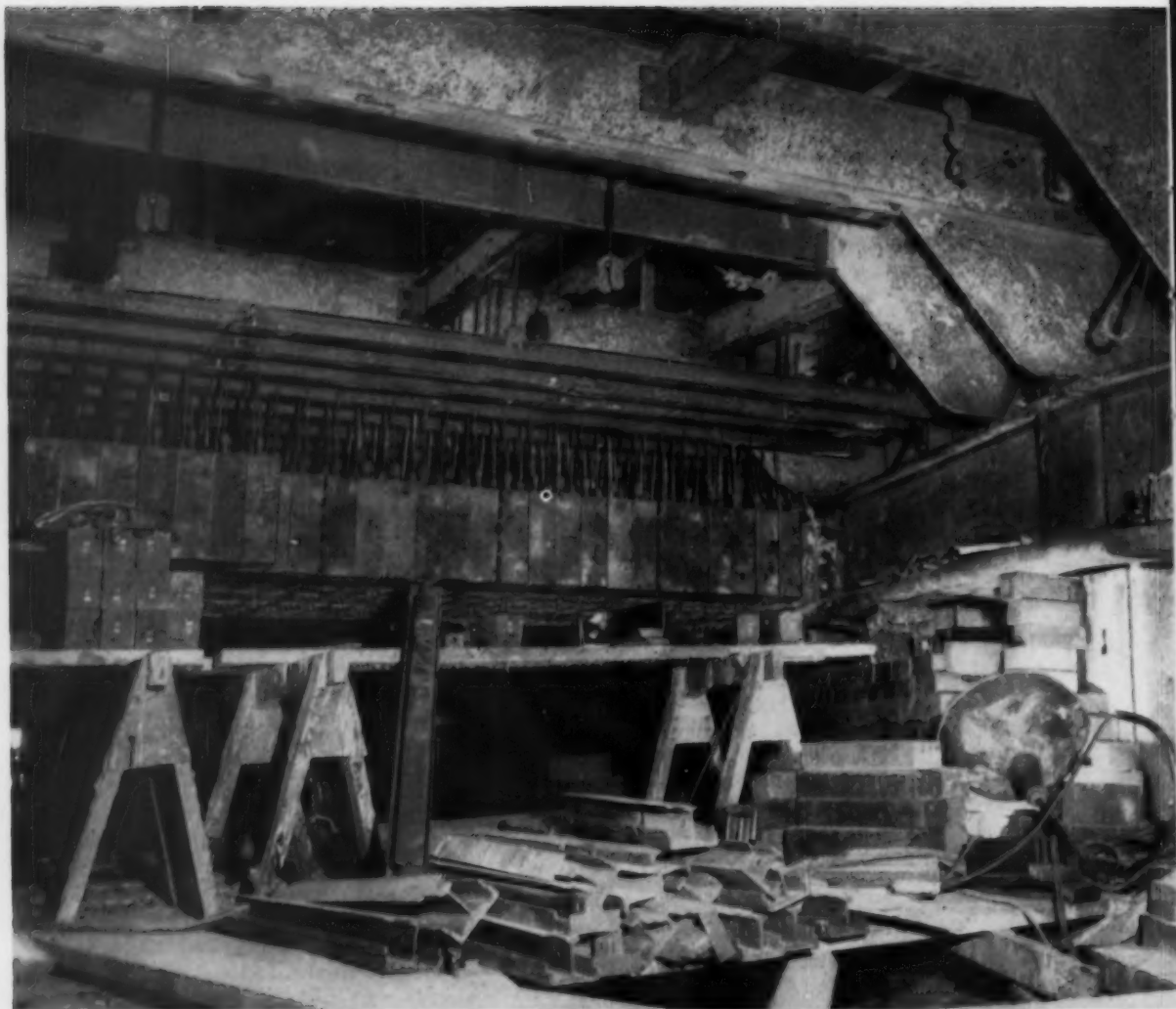


FIG. 4—Inverse penetration times for different joint spacings, using 4 by $\frac{1}{2}$ -in. copper joints, 50:50 lead:tin solder and DTD 81 flux.



ALL BASIC flat suspended roof shown during installation at Keystone Steel & Wire Co. is now

well into its second campaign. A 10 pct increase in productivity has been reported.

Capacity Gains, Fuel Savings Push All-Basic Openhearth

8 hour heats—

♦ After years of trial and error experiment the all-basic openhearth is starting to move . . . Two steel producers will begin work on all-basic furnaces early next year . . . Growing interest stems from reports of 20 pct gains in steelmaking capacity and 5 pct savings in fuel consumption . . . Higher brick costs are partially offset by the use of less brick.

♦ **TWO STEEL PRODUCERS** will begin work on all-basic openhearth furnaces early next year. At the same time, at least two more will begin revamping their raw materials handling lines to accommodate the faster pace of firing required by the all-basic openhearth line as compared with conventional silica brick openhearth.

Why the sudden interest in all-basic openhearth? It stems from reports early this year that as much as a 20 pct gain in steelmaking capacity when using an all-basic openhearth furnace as compared with conventional silica brick openhearth. At the same time came word that fuel consumption had, in several all-basic openhearth campaigns, been cut 5 pct below the Btu per ton requirement of conventional openhearth. An average silica based refractory, say a roof brick for a conventional openhearth, will melt at about 3050°F. Chrome additions can boost the melting point of the brick to 3500°F, and magnesia can skyrocket melting points to 5000°F. And as allowable furnace heat levels go up, so does steelmaking capacity.

Higher cost per brick

What's an all-basic furnace? The conventional openhearth is technically a basic furnace. The hearth is composed of basic brick. Roof and walls are of less expensive silica brick. An all-basic openhearth utilizes the basic hearth, then adds basic walls and roof or even a cap of basic brick over the checker work.

On a cost per brick basis, an all-basic furnace would cost four times as much as a conventional silica brick furnace, one of the major drawbacks in initial all-basic operations. In practice, however, there is evidence that a new all-basic furnace could be built for \$800,000 as compared with costs for a comparable silica brick furnace of \$700,000 to \$750,000. Many steel men would argue the point, but there is sufficient evidence to support these cost figures.

Again, a conventional openhearth roof may be 18 in. in depth in the valleys, 22 in. depth at the ribs, whereas successful operating all-basics utilize a suspended roof that requires only a 15 in. overall roof depth. At the end walls, a conventional silica brick wall may run from 18 to 22.5 in. in thickness as compared with operating thicknesses in all basic end walls of only 13.5 in. This boils down to more cost per brick, but the higher cost is partially offset by the use of less brick.

Veteran explorer in the field is U. S. Steel's No. 10 furnace at the company's South Works, Chicago. Since June, 1947, 11 campaigns and more than 5000 heats and better than 8 years old, this veteran has been pouring steel with an increasingly efficient record. Keystone Steel & Wire at Peoria began work with an all-basic furnace that is now well into its second campaign, has reported a 10 pct increase in productivity but no gain in fuel input.

These two stand alone at present in a field that has been entered by many for short periods. One discouragement has been the comparatively long life records of European all-basic operators compared with roof life obtained in the U. S. Part of the answer seems to be finally emerging. Though it is true that European operators obtained roof life of as much as 1000 heats, this was in small capacity furnaces. When compared with U. S. all-basics of comparable size, the European record is little better than roof life in the U. S.: somewhere around 300 heats.

Cut fuel costs

When steel output totals are finally compared, it is expected that any gain in Europe in getting more mileage out of the expensive all-basic refractory brick will have been offset by comparatively lower production.

U. S. Steel's furnace No. 10 averaged 4.6 million Btu per ton on fuel use in her first seven campaigns. At that point the average began to drop to the 5 pct fuel savings over conventional openhearth operating in the same shop. It is not positive this will happen every campaign, but the average saving for the last three campaigns is pretty close to that figure.

On a comparative basis, the old rule of thumb for conventional openhearth operation was 300 heats per roof; 4 million Btu per ton of steel in the fuel department; and 10.7 hr per heat. These figures date back to 1951 and with oxygen, compressed air, and other improvements, heat time has sometimes been reduced by as much as 2 hr. The all-basic can get 200-300 heats per roof, uses 4 million Btu of fuel per ton of steel; and will run through a heat in 9 hr—and has produced heats in as short a time period as 6 hr.

See longer roof life

With a new brick 300 heats per roof are expected to be average. Optimists claim that, in a suspended roof like those in both all-basic furnaces now in operation, a potential of 600-700 heats per roof are entirely within the realm of possibility using this new brick.

It's well to add, however, that a suspended roof allows operating the openhearth when the roof bricks have already been worn to a thickness at which conventional furnace construction would threaten roof collapse.

Although initial cost is high, basic brick may in the future more than pay off in terms of its ability to withstand faster openhearth rates with less downtime for major repairs and temporary hot patching.

After 8 lean years of experiment; and even drier years before when several steel companies tested the all-basic furnace briefly and then dropped it for various reasons, the all-basic openhearth is beginning to move.

Complex Transmission Castings Cleaned, Descaled Electrolytically

♦ Castings for automatic automobile transmissions must be completely free of sand and scale if they are to give a reasonable service life . . . At the Marvel Schebler Div., Borg-Warner Corp., rigid cleaning specifications were set—and met.

♦ Cleaning is done electro-chemically by immersing parts in a salt bath . . . An automatic conveyorized unit effectively cleans a work fixture of cast parts every one to two minutes . . . Machining after cleaning is easier and tool life is improved.

By J. BIRNBAUM, Chief Metallurgist, Marvel Schebler Div., Borg-Warner Corp., Decatur, Ill.

♦ **CLEANING** of automatic transmission castings for passenger cars involves more than ordinary treatment. One of the basic requirements is that the casting surface be free of annealing scale and sand to prevent possible fouling or abrasion in service of highly finished valves or other mechanisms.

The complex gray iron castings used in automatic transmissions pose a difficult problem. The stringent standards of cleanliness set for the production line must be met. Yet, conventional blasting, pickling and washing techniques do not do the job that is required.

Adhere to rigid specs

A cue to this solution came from hydraulic manufacturers. It was the Kolene process. Recognizing the need of a rigid cleaning specification similar to that of hydraulic manufacturers, Marvel Schebler Div. installed a fully automatic conveyorized unit for its application.

Past experience has shown that scale and abrasive materials on casting surfaces greatly reduce tool life; therefore, by presenting a machining surface free from scale and abrasive

materials, tool life is increased appreciably, resulting in decreased production costs.

The cleaning unit incorporates a number of features which improve material handling and increase efficiency. It is designed to process 1500 sets of coatings in a 15 hour operating period. The unit was installed adjacent to the stress-relieving furnace so that any or all stress-relieved parts can be treated by the process.

After loading, parts are first immersed in Kolene No. 4 salt. They then pass through a water rinse or cooling zone, another water rinse and a final immersion in hot rinse water, followed by unloading. Except for loading and unloading, the operations are automatic.

Work fixtures which carry the parts can handle four automatic transmission cases, each weighing 55 lb; or 24 front pump castings averaging 15 lb each; or 24 rear pump castings with an average weight of 5¾ lb; or 24 brake drum castings having an average weight of 3¾ lb; or any combination of these castings.

The unit is equipped with two conveyors—one for service and the other for processing. The service conveyor is provided with a variable

speed drive. When operating at minimum speed, it delivers a load of castings every two minutes. At maximum speed, it delivers a load every minute. After a work fixture is loaded, it moves toward the entrance of the cleaning unit on this electrically-driven conveyor.

Each service conveyor hook is equipped with directional turning cams which assure proper positioning of the work fixture as it enters the unit. When the service conveyor transports the loaded fixture directly over two lift bars, a limit switch causes these hydraulically-operated bars to lift the fixture from the service hook. As the service conveyor continues its forward motion, the fixture is lowered onto a process conveyor. This hydraulically-operated conveyor then advances the loaded work fixture in 6-in. increments.

Hydraulic arms lift work

Just before the fixture arrives at the Kolene pot, two hydraulically-operated notched lever arms engage the cross bar of the fixture, lifting the fixture from the processing conveyor and lowering it into the salt bath.

Grooved brass collector shoes at each end of the cross bar engage a copper bus bar. The process conveyor slides the shoes on the automatically lubricated, water-cooled bus bar, assuring constant positive electrical contact.

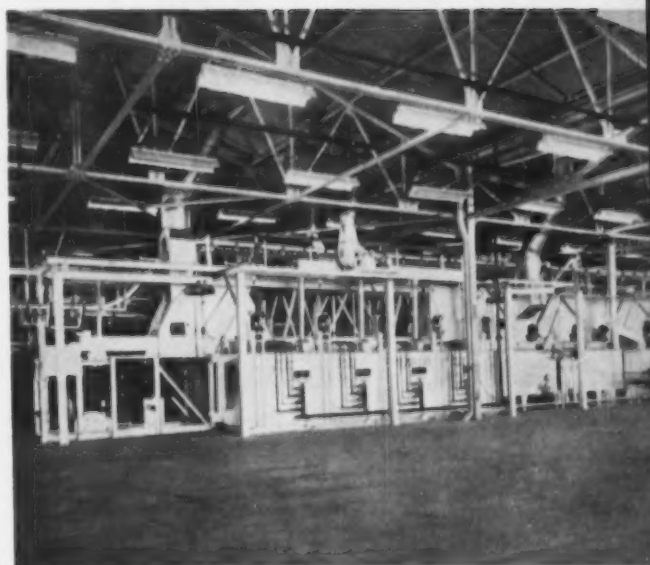
As the work fixture arrives at the exit end of the salt bath, two notched lever arms again engage the cross bar, lift the work from the salt bath thus breaking electrical contact, then lower the fixture into the first tank.

Normally, this tank is used as a water rinse, but it may also be used as a cooling zone. When used as a cooling zone, a water floor is provided for disposal of drippage from castings after being removed from the salt bath. Work moves forward in this tank in eight 6-in. increments.

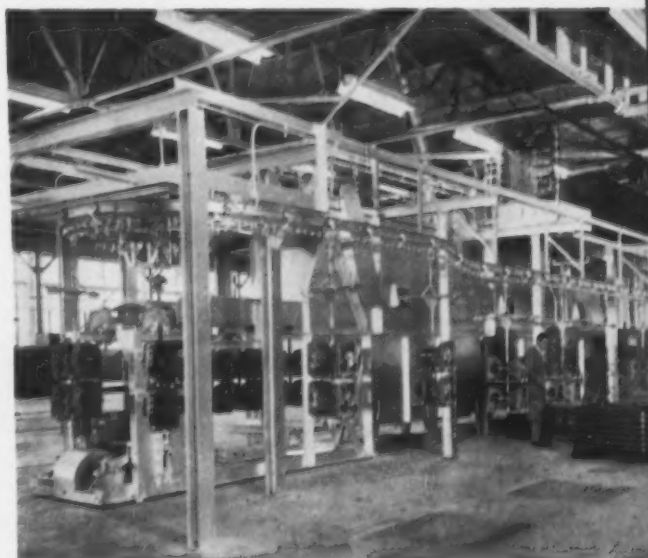
The loaded work fixture is then transferred again by means of notched lever arms from the first tank to the second tank. This tank may be used either as a room-temperature water rinse, or the water may be heated by the immersion tubes which are provided. Work in this tank advances in 11 6-in. increments. In a similar manner, the work is transferred into a third hot water rinse tank, then into the exit zone.

Service hooks pass over unit

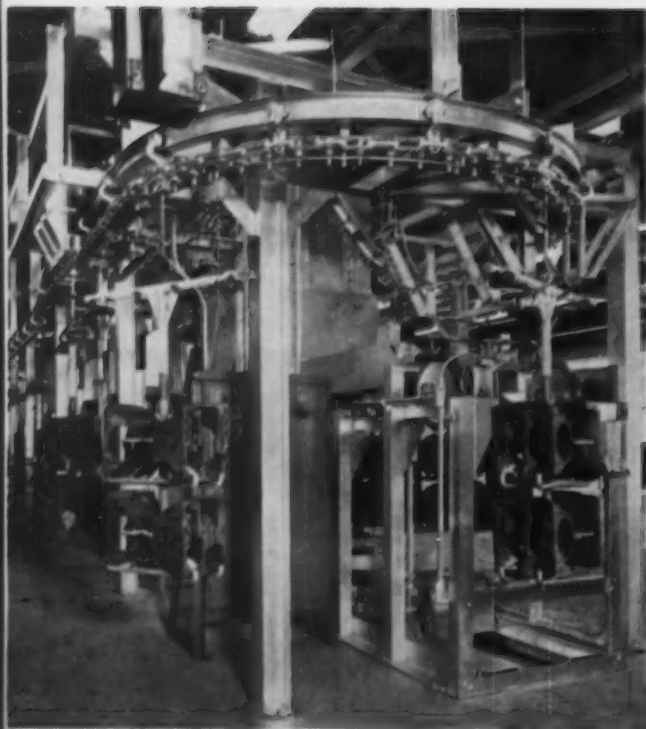
The service conveyor carries the unloaded service hooks over the top of the cleaning unit and lowers them to a position to engage the work fixture cross bar. When the loaded work fixture reaches this point, notched bars raise it from the process conveyor to a position where it is picked up by the service conveyor hook and transported to the unloading zone. The fixtures are then recycled.



CONVEYORIZED salt bath cleaning unit processes a rack of castings every one to two minutes.



AT EXIT END, the service conveyor picks up fixtures and delivers them to the unloading zone.



SERVICE conveyor carries automatic transmission cases to cleaning unit's entrance. Hydraulically-operated bars lift fixture from hook.

The pot containing the salt bath operates at 850° to 950°F. It is heated by eight burner tubes on each side mounted two abreast. The main chamber of this bath is 22 ft long by 9 ft wide by 4 ft deep. The burner tubes are mounted in chambers separated from the main body of the pot.

Electrically driven agitators are mounted between each burner tube assembly and at each end of the pot. The tank is tapered from the outside shell toward the center under the burner tubes and agitators. This permits any sludge to be held in suspension in the agitated work area.

A sludge zone is provided at one end of the work area. It has only two openings. One is a vertical slot at the outgoing end of the dividing wall to permit the molten salt with its suspended sludge to enter into the non-agitated sludge zone.

Cleaner recirculated

At the opposite end of the sludge zone, a horizontal spillway opening is provided at about the liquid level of this non-agitated sludge zone. Thus, sludge may settle in this zone and the uncontaminated cleaner at the liquid level may enter the burner tube area to be reheated and recirculated by the agitators.

Six sludge pans connected one to another are mounted in the sludge zone. These are suspended

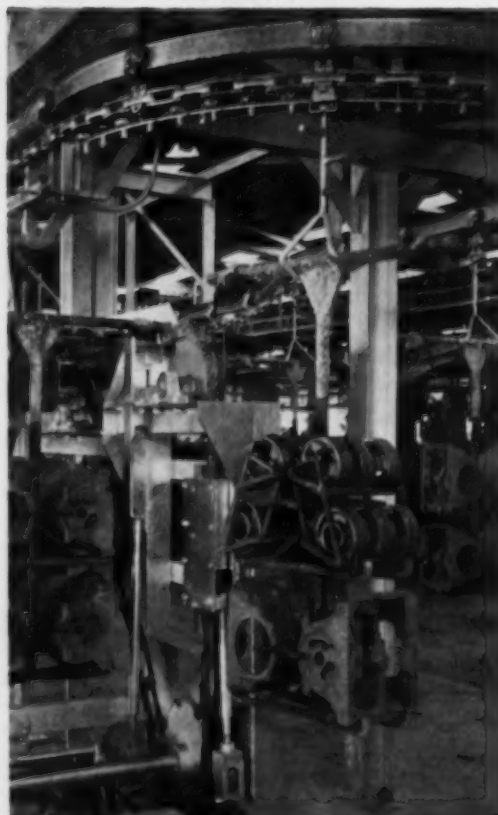
on insulated covers by means of rollers. The bottom of the sludge pan is about 3 in. from the bottom of the sludge zone.

When a sludge pan is removed to the entrance end of the pot, the remaining five sludge pans are propelled toward the entering end of the pot leaving an opening for a clean sludge pan to be placed at the forward end of the sludge zone.

There are a total of 53 fixtures in service at one time. These are on 18-in. centers as they enter and leave the unit and on 6-ft centers while on the service conveyor. When the service conveyor travels at 6 fpm, the work remains in the Kolene bath for 12¼ minutes.

The unit itself occupies a floor area 90 by 16 ft and is 15 ft high. It utilizes gas at the rate of 3400 cfh and water at 1000 gal per hour. Direct current for the unit is furnished by five Udyllite-Mallory selenium type rectifiers, each with a capacity of 1500 amp at 6 v. Bath temperature is controlled through a Brown electronic strip chart recorder controller.

The salt bath is an electrically activated, catalyzed, molten oxidation or reduction bath. After cleaning, parts are easily rinsed of all traces of the salts since they are completely water soluble.



WORK FIXTURES, 53 in number, carry from 4 to 24 castings. Cams on hook assure proper positioning of work load as it enters the unit.

JACK & HEINTZ

Saves \$1584 per hour...



Jack & Heintz Inc. silver brazes over 25 different parts on this 15 KW, 10,000 cycle TOCCO machine.

with TOCCO* Induction Brazing

Brazing Costs Down

When Jack & Heintz engineers switched from torch brazing to automatic induction, brazing cost of these inverter brush mounts fell from \$.05 to \$.006 each—a reduction of 83% in direct labor costs alone! Additional savings result because less cleaning is required after TOCCO, and fuel costs are much lower, too.

Brazing Production Up

While costs dropped, production on the part zoomed—from 40 to 360 brazed assemblies per hour. Furthermore, rejects and scrap, formerly high, are now negligible.

Versatility

The part shown is just one of over 25 parts, large and small, which alert J & H engineers have converted from old-fashioned brazing methods to modern, automatic TOCCO. Overall brazing costs (TOCCO brazing versus former methods used) are down 75%—brazing speed, up 100%.

* * *

If the manufacture of *your* product involves brazing, heat-treating, forging or melting of ferrous or non-ferrous metals, don't overlook TOCCO as a sound method of increasing production, improving product quality and slashing costs.

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New Technical Literature:

Catalogs and Bulletins

Strip-chart recorders

A new bulletin describing the company's line of 6-in. strip-chart recorders for pressure, liquid level, temperature, flow, and mechanical motion has just been released. It contains installation drawings showing methods of applying the instruments to the different variables, as well as photographs of the various models and their features. *The Bristol Co.*

For free copy circle No. 1 on postcard, p. 125.

Standard carbide blanks

Information concerning standard carbide blanks for mechanically-held tools is included in a new 8-page catalog. The new publication covers carbide blanks for clamp-on style tools, solid carbide on-end inserts, round and square inserts, and triangular and square throw-away insert blanks. *General Electric Co.*

For free copy circle No. 2 on postcard, p. 125.

Industrial locomotive

A bulletin describes the company's Model Sh-2225 diesel-hydraulic industrial locomotive. Included in the bulletin are tables of characteristics, descriptive information on the component parts, a capability table, tractive effort curve, etc. *Baldwin-Lima-Hamilton Corp.*

For free copy circle No. 3 on postcard, p. 125.

Conveyor belting

A wall chart on the proper selection and maintenance of conveyor belting is offered to conveyor users. The chart contains 12 practical maintenance tips for getting more life out of belts. It deals with storage of belts, correct design of loading chutes, use of automatic switches, lubrication, inspection, and other important aspects of maintenance. *Hewitt-Robins Inc.*

For free copy circle No. 4 on postcard, p. 125.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 125.

Chromium plating process

A 4-page bulletin describing the new Unichrome Crack-Free chromium plating process outlines the advantages of this new process with emphasis on the superior corrosion resistance and buffability of the deposit. *United Chromium Div. Metal & Thermit Corp.*

For free copy circle No. 5 on postcard, p. 125.

Rotary machine

"Twelve Machines in One," the new and versatile Niagara No. 150 hand operated deep throat combination machine, has just been added to the extensive Niagara line of power and hand operated rotary machines. Readily equipped with 12 different pairs of standard rolls, this machine can perform a wide variety of jobs: turning, burring, wiring, elbow edging, single beading, OG beading, crimping, furnace collar edging, body flanging, slitting and trimming. *Niagara Machine & Tool Works.*

For free copy circle No. 6 on postcard, p. 125.

Fabricated items

A new 12-page brochure is now available on fabricated Haveg 1810, a pure, unplasticized, optimum chemical resistant. This brochure gives the latest information on chemical resistance, properties and fabrication procedures. *Fabrication Div. Haveg Corp.*

For free copy circle No. 7 on postcard, p. 125.

FREE TECHNICAL LITERATURE

Hi-vac

A new catalog describes in detail and illustrates High Vacuum Equipment Corporation's mass production and experimental type metallizing units. Detailed information is given on the special Planetary Interior Mechanism originated by the company which assures greatest production flexibility and economy. Also included is a description of the vacuum metallizing process, pointing out the versatility and time and money saving features of this modern technique. *High Vacuum Equipment Corp.*

For free copy circle No. 8 on postcard, p. 125.

Glass sealing alloys

Glass sealing tubing made from constant or uniform expansion alloys is described in a data memorandum. The data covers six glass sealing alloys in standard production at Superior. Included in the data are production limits, nominal chemical analysis, temper ranges, mechanical properties, thermal properties, and tolerances. *Superior Tube Co.*

For free copy circle No. 9 on postcard, p. 125.

Portable potentiometers

Complete information about single, double, and triple range portable potentiometers, widely used for numerous emf measurements in plant and laboratory, is now available in a 2-page data sheet. This sheet lists instrument features and tabulates the characteristics of each potentiometer for ready comparison. *Leeds & Northrup Co.*

For free copy circle No. 10 on postcard, p. 125.

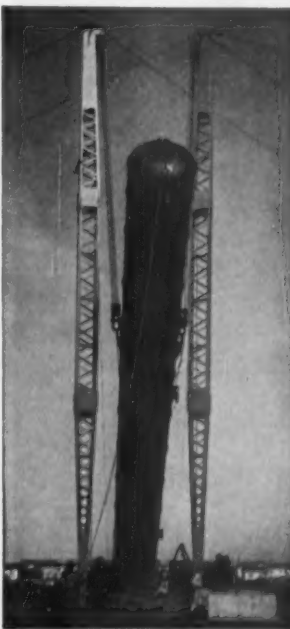
Color slide sequences

Suggestions for the preparation and effective use of color slide sequences in business and education presentations are embodied in a pamphlet extensively revised and now ready. The leaflet stresses the advantages of such a sequence of 2 by 2 slides. It is simple to make, flexible in use, and can be shown to a widely varying number of people, from one person to a large audience. *Eastman Kodak Co.*

For free copy circle No. 11 on postcard, p. 125.



Multiple-part Red-Strand Slings handle heaviest loads, and are easy to apply to both the load and the crane hook. User tests in Detroit proved Red-Strand slings withstood unusual abuse, yet maintained higher-than-rated strength. A Gary plant uses Red-Strand single-part slings for many lifting jobs like this. These slings are available with various combinations of end fittings for attaching the sling to rings or lugs.



A heavy cylindrical load usually coils for multiple-part Red-Strand Flat-Laced slings. They are strong, flexible and do not slip or abrade.

How to Select the Correct Sling for Your Job

Start your sling selection by analyzing five factors:

1. The load—its size, weight, shape, finish.
2. Working area, amount of head room.
3. Size and type of crane hook.
4. Angle of sling legs.
5. Location and type of lugs or rings, if any.

From this information your supplier can recommend the sling by type, size and length that is safest, longest lasting and most economical for your job.

Types of Slings

Multiple-part slings are always recommended for heavy duty service, because for equal strength they are far more flexible than single-part slings. They hug the shape of the load easily, present a greater bearing surface to the load, and reduce the possibility of marring surfaces.

Where these factors are not so important, either Red-Strand *single-part slings* or *grommet slings* may be used for economy. Single-part Red-Strand slings are often recommended for lifting lighter weight objects, or those that have fixed attaching rings or lugs. Grommet, or continuous strand Red-Strand slings are ideal for forming hitches of various types without fittings.



When you re-use Pin-Lock thimbles you reduce sling costs by 21%

Extra Savings

Two suggestions will help you save money on slings.

The first is to re-use Pin-Lock thimbles on multiple part slings. These exclusive Leschen Pin-Lock thimbles cut sling costs on an average of 21% because they may be used again and again. They lock into sling loops with pins instead of permanent clamps, permitting re-use, and eliminating constant expense of thimble replacements.

The second suggestion is to use Red-Strand slings because they are made of higher-than-rated quality Leschen wire rope that delivers longer-than-expected service.

Get a copy of Leschen's *Sling Handbook* for complete information. Ask your Leschen man for one, or write.

Depend on Leschen's higher-than-rated quality for longer-than-expected service.

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Press operator Hannah Jones, who has worked presses of different makes for several years, prefers this 100-ton Warco to anything she has operated. Here she shows Personnel Director Myron Timms one of the reasons why—the increased production of tractor muffler heads.

**"Since We've Tried WARCO Presses
We've Bought Nothing Else" - Says
Leading Automotive Muffler Manufacturer**

Company That Operates 130 Presses Has Purchased Only Warco Equipment Since 1951

The MacKenzie Muffler Co., Inc., is recognized as one of the nation's leading designers and builders of mufflers for the automotive industry. In the manufacture of their product the blanking and forming press plays an important part. In fact, this concern has more than 100 presses in daily use. In 1951 they decided

to try their first Warco Press. They watched it closely, recording production and maintenance figures. "It sold itself to us," say company officials, "so well that we have purchased nothing but Warcos since."

Warco quality is like that. Once you compare you'll discover that Warco Presses outperform them all. It will pay to let your Warco representative know the next time you're in the market for press equipment.



THE FEDERAL MACHINE AND WELDER CO.
WARREN, OHIO

FREE TECHNICAL LITERATURE

Precision stamping

The first annual precision stamping directory lists precision job stamping sources all over the nation, giving sufficient information about each source to enable a purchasing agent to make a preliminary analysis of prospective vendors. *American Silver Co.*

For free copy circle No. 12 on postcard, p. 125.

Unit conditioners

A new 4-page illustrated catalog describes the new Diaflo unit conditioners for summer cooling and winter heating in multi-room structures. Operation, construction and design features are thoroughly covered in the catalog. *American Blower Corp.*

For free copy circle No. 13 on postcard, p. 125.

Parts needed fast

Downtime is expensive. When a part breaks, replacement is needed in a hurry. "Parts Needed Fast" tells how the Caterpillar parts service is designed to get Cat-built equipment back to work quickly. *Caterpillar Tractor Co.*

For free copy circle No. 14 on postcard, p. 125.

Craneleasing

A new 4-page brochure, Orton Craneleasing, has been released. The bulletin describes the advantages of leasing cranes without capital investment, and gives examples of payment charts as well as re-leasing payments. *Orton Crane & Shovel Co.*

For free copy circle No. 15 on postcard, p. 125.

Vacuum sheet lifter

Sheets up to 5 ft wide by 20 ft long are safely and easily lifted and handled with the Littell 8-Cup Roll-Over Vacuum Sheet Lifter. This lifter is described and illustrated in a leaflet now available. *F. J. Littell Machine Co.*

For free copy circle No. 16 on postcard, p. 125.

Flexon

A new 16-page catalog has just been released describing the company's line of Flexon bellows and Flexon flexible metal hose. This catalog has been prepared to assist the designer in selecting proper bellows or hose for his particular application. *Flexonics Corp.*

For free copy circle No. 17 on postcard, p. 125.

(ACTUAL UNRETOUCHED PHOTO)

Here's why NIRONITE "F" work rolls outproduce other types in hot mills

Take a look at the close grain structure and deep shell of this test-fractured 21" diameter Mack-Hemp Nironite "F" work roll. You can actually see why Nironite "F" rolls give you greater tonnages between regrinds . . . why they offer greater resistance to banding . . . why they last all the way to worn-out diameter. So distinctive is this close grain structure that mill

operators report that they can recognize Nironite "F" rolls by the continued good roll surface even after long use—whether or not they have seen the stripes on the wabblers.

Nironite "F" rolls are high-nickel, high-chromium alloy grain type, double poured for maximum strength. They can be supplied in any desired hardness from 65 to 85 Shore sclero-

scope (C Scale).

Mack-Hemp offers an entire series of Nironite nickel-chromium cast iron alloys for 2-high or 4-high hot mill roughing, intermediate and finishing rolls. Your Mack-Hemp sales engineer will be glad to give you assistance in choosing exactly the right type and hardness for your particular rolling problem.

MACKINTOSH-HEMPHILL

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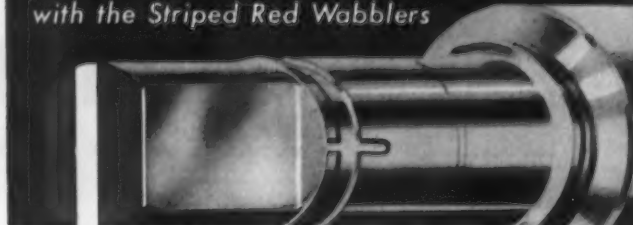
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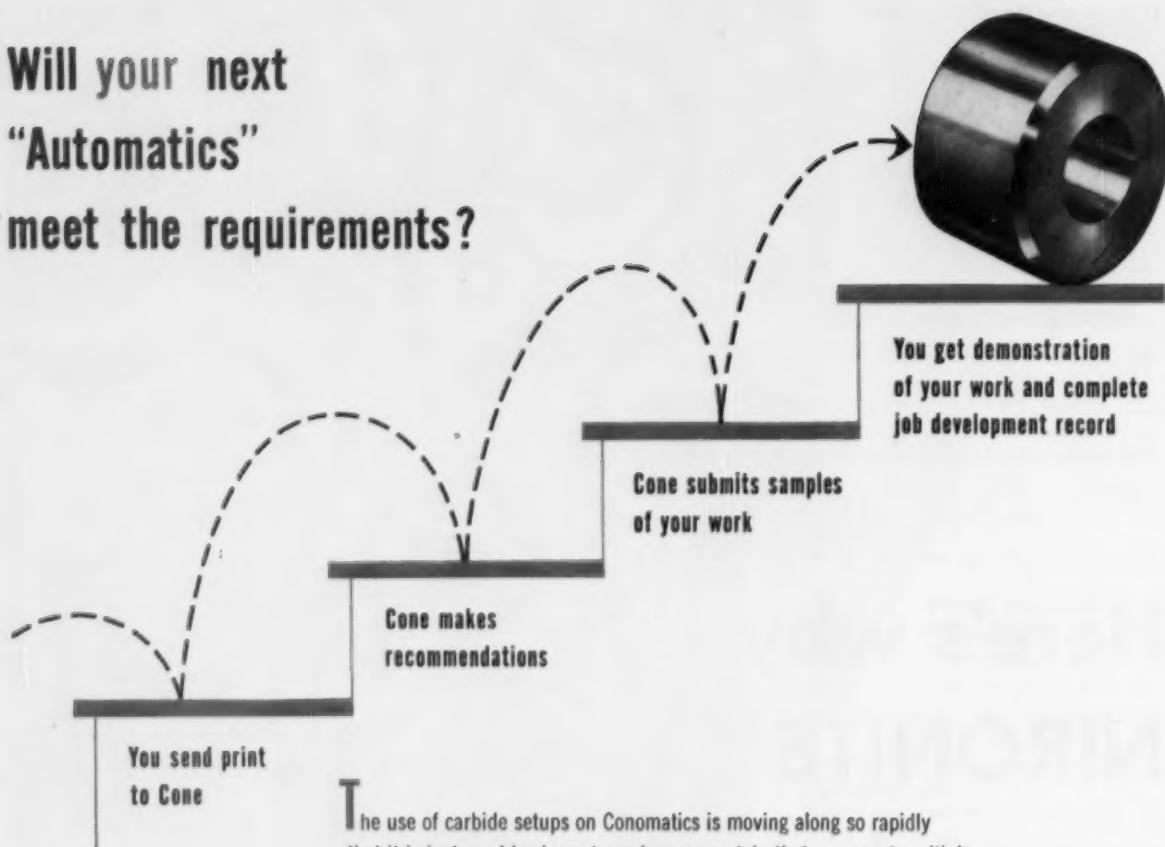
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with the Striped Red Wabblers*



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Will your next
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meet the requirements?



The use of carbide setups on Conomatics is moving along so rapidly that it is just good business to make very certain that your next multiple spindle automatics will meet 100% carbide tool requirements.

You can be certain by seeing a demonstration of the machine of your choice equipped with carbide tools on your own work. That is, you can if it is a Conomatic.

Without charge, except for bar stock and tools, you can be an on-the-job witness to a carbide test run of your own work on a Conomatic.

And whether you are ready for carbide now, or will be later, you will want to consider a machine that is superior for either carbide or hss.

DATA FOR COMPARISON

Part	Roll	Depth Hole.....	1 1/32"
Machine ..	1 1/8" Six Spindle Conomatic	Work Dia.....	1 1/16"
Material.....	.8620 HR	Drill Dia.....	1 1/16"
Tools.....	100% Carbide Tipped	RPM.....	1216 Work Spindle
Stock Size.....	1 1/8"		1040 Op. Drill
Length.....	1 1/32"		2256 Total Eff'd.
		Time.....	10.7 Seconds



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This section starts on p. 120

Hole punching units

Users can build their own hole punching assemblies through the use of individual punches, dies, punch guides, and stripping springs with the Wales type MH multiple hole punching system described in an 8-page catalog. *Wales-Strippit Corp.*

For free copy circle No. 18 on postcard, p. 125.

Duplex milling machine

A booklet which contains illustrations and descriptions of the model 10RH ram turret duplex milling machine and the model 10R ram turret vertical milling machine is available. It contains information on the extra attachments and equipment which are available for handling a wide range of work economically. *Axelson Manufacturing Co., Div. U. S. Industries, Inc.*

For free copy circle No. 19 on postcard, p. 125.

Mixing chart

A handy informative mixing chart illustrating the amount of tooling plastic needed for a given job is available. Using this mixing chart you will be able to figure out the amount of material needed for a given job in either ounces, pounds or grams. *Rezolin, Inc.*

For free copy circle No. 20 on postcard, p. 125.

Contour milling cutters

Errors and inaccuracies usually caused by hardening processes are completely eliminated in this method of automatically grinding the final shape of the teeth of contour milling cutters after hardening. *Homestrand, Inc.*

For free copy circle No. 21 on postcard, p. 125.

Pneumatic cylinders

The streamlined barrel construction of the pneumatic cylinders is one of the features discussed in a new booklet. It contains: advantages; sizes; mountings; stroke; pressures; temperatures; how to order; how to select cylinder diameter; levers, etc. *Westinghouse Air Brake Co.*

For free copy circle No. 22 on postcard, p. 125.

Oil burner motors

A bulletin on the company's lightweight Ohio Series 991 oil burner motors gives full details including specification data, etc., and is illustrated with exploded views, performance curves, and dimensional diagrams. *The Ohio Electric Manufacturing Co.*

For free copy circle No. 23 on postcard, p. 125.

Handy data file

A handy data file which is now available contains complete information on 7 types of Mac-it socket screws plus Mac-it hex-socket keys with regard to: dimension standards, standard sizes, physical properties, recommended tightening torque, suggested applications and uses. *Mac-it Screw Div., Strong, Carlisle & Hammond Co.*

For free copy circle No. 24 on postcard, p. 125.

Reconditioning

The when and how of reconditioning drill and cutter bits are described in a new brochure. The booklet explains reconditioning practices and procedures; grinding and wheel care, and maintenance of machine, drill, roof, earth and rock bits. *Kennametal, Inc.*

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41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page Product

Page Product

Page Product

Your Name

Title

Company

Co. Address

City

State

Bronze bearings

Items covered in a new catalog include Kingwell bronze bearings and bar stock, Chrysler Oilite bearings and bar stock and Asarco continuous cast bronze bar stock. Complete listings of stock sizes are itemized for each line. Facilities for manufacture of special sizes, alloys and types of bronze bearings are also pictured and described. *Kingwell Bros., Ltd.*

For free copy circle No. 26 on postcard, p. 125.

Stainless steel

Additional technical information on AM 350, the new stainless steel that bridges the gap between the 300 and 400 series, is included in a 10-page booklet. Tables on mechanical properties, stress rupture properties, elevated temperature tensile properties, corrosion rates in various media, and effects of cold rolling and aging on hardness and tensile properties of AM 350 are included. *Allegheny Ludlum Steel Corp.*

For free copy circle No. 27 on postcard, p. 125.

Fasteners

Hundreds of different sizes and types of fastening devices and formed parts for application by resistance welding are shown and described in the well-illustrated 32-page "Fiftieth Anniversary Catalog No. 55" which is now available. Data is given on such fasteners as nuts, brackets, screws and pins for projection and spot welding application. *The Ohio Nut & Bolt Co.*

For free copy circle No. 28 on postcard, p. 125.

Punch presses

A new folder on the Kenco punch press line ranging from 1½ to 15 ton capacities is available. The folder details construction features which the maker states eliminate downtime, increase press life, and assure precision punching. These features are common to all units in the line-standard, deep throat and extremely rigid deep throat types. *Kenco Manufacturing Co.*

For free copy circle No. 29 on postcard, p. 125.

Autopneumatic control

The new autopneumatic control is the latest Arrow development to provide complete automatic control for all applications of compressed air on pneumatic equipment and devices. A booklet which describes this development contains graphs, diagrams, and tables. *Arrow Tools Inc.*

For free copy circle No. 30 on postcard, p. 125.

Metal gate valves

An informative, illustrated circular describing "Causul" metal gate valves, designed for corrosive service, has been published. Metal valves have proved eminently successful for handling corrosive fluids in oil refineries and industrial establishments producing caustics, textiles, rayon, fertilizers, coke and paper. *Lunkenheimer Co.*

For free copy circle No. 31 on postcard, p. 125.

Shelving

A new 32-page catalog on unitized flexi steel shelving is available. The catalog describes Borroughs' exclusive construction and installation features; illustrates 24 of its many different units; and offers detailed information on how to plan a steel shelving layout. *The Borroughs Manufacturing Co.*

For free copy circle No. 32 on postcard, p. 125.

Surface grinders

New type D Thompson surface grinder catalog describes the latest addition to the Thompson line of small super-precision surface grinders. All details are clearly illustrated in color and complete drawings and specifications are provided. *The Thompson Grinder Co.*

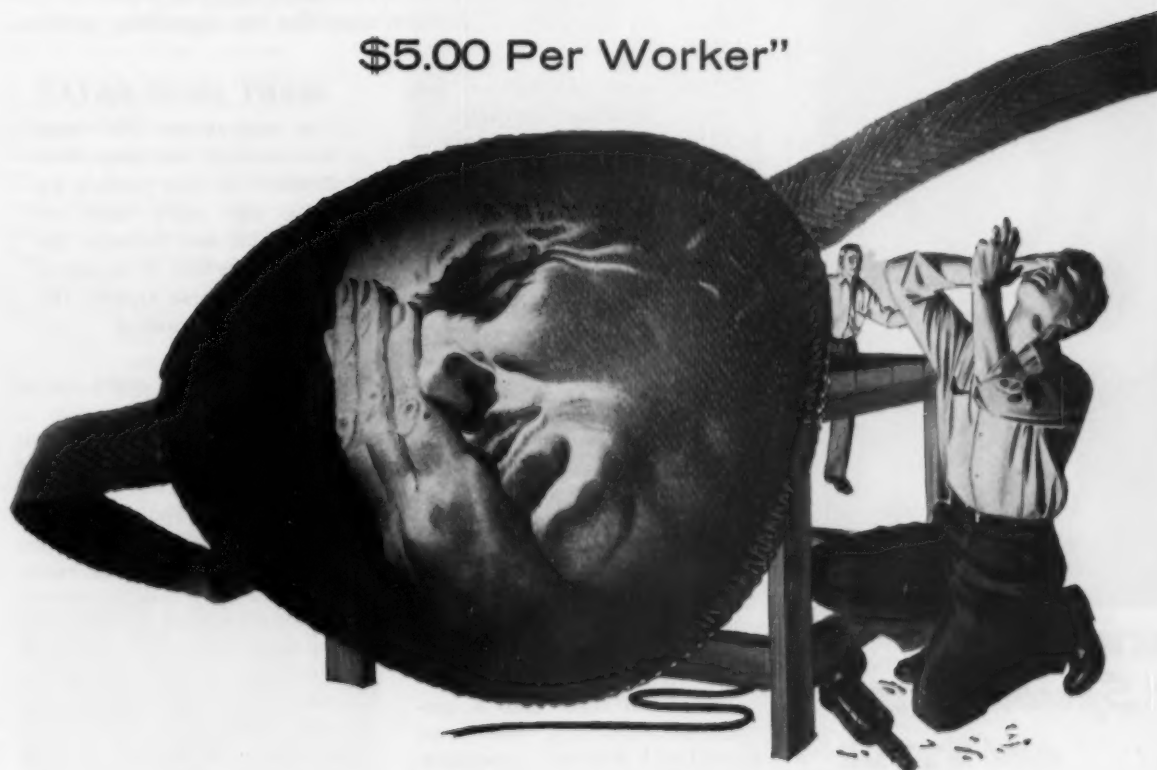
For free copy circle No. 33 on postcard, p. 125.

Air-line lubricators

All users of air-operated tools should be interested in the new bulletin on "Air-Line Lubricators" available. The lubricators described in this bulletin are made in sizes for use with the smallest hand-held air tools to the largest quarry-type drills. *Ingersoll-Rand Co.*

For free copy circle No. 34 on postcard, p. 125.

We've been saying
 "Eye Accidents Cost More Than
 \$5.00 Per Worker"



Here's One that Cost \$3,674.88!*

A riveter while reaching under a table to receive his rivet gun sustained an injury causing permanent partial disability consisting of the loss of his right eye. The trigger caught on a protuberance which operated the mechanism, permitting an inrush of air to the gun. This caused the rivet-set to fly out and strike the claimant in the eye. Outcome: An award of \$2,449.92 was made as normal compensation plus an additional one-half of that sum for the "willful" misconduct of the employer in failing to provide adequate safeguards.

Are you and your workers protected? The cost is low indeed when you consider that 98% of indus-

*In compensation alone

trial eye accidents can be prevented for an average investment of \$2.30 per worker in high quality A safety glasses. Yes, and there are other benefits in lowered insurance costs, savings on idle machine charges and maintained production. Always look for the A monogram on safety lenses and frames. It is your assurance of quality. Write American Optical Company, 579 Vision Park, Southbridge, Mass., for booklet. Or ask an A Safety Representative to call.



ITM. Reg. by American Optical Company

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SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

FORMING: Centralized System

Three presses now produce all G-E refrigerator pans and shelves . . . Centralization improves cost picture, simplifies the expediting problem.

Three Bliss transfer feed presses, recently installed at Louisville, Ky., are producing all the refrigerator pans and shelves General Electric needs for its annual output of more than a half million refrigerators.

Production of these parts formerly required the services of two or three vendors, doubling or tripling the costs of dies and labor, and creating difficult expediting problems. With automatic coil handling equipment especially designed for the presses, all stampings are produced direct from regular mill coils.

Three Press Lines

Three separate press lines are involved—a 700-ton, seven-station press that produces 12 deep-drawn refrigerator pans per minute and feeds them onto a conveyor automatically, and two identical 800-ton, six-station presses. All are equipped with coil cradle, straightener and roll feed. Each 800-ton press produces rotary and stationary shelves at the rate of 15 per minute.

Method of operation is common to all three.

Sequence for refrigerator crisper pans, for example, is: (1) cut-off and draw, (2) rough trim rear half of flange, (3) rough trim front half of flange, (4) cam form sides of pan, (5) cam form front recess and pierce two holes in sides, (6) curl rear flange and form indentations in side flanges, (7) finish trim flanges.

Rotary Lines Similar

Rotary shelf lines are quite similar, except that, instead of loading directly onto a conveyor, rotary shelves are automatically

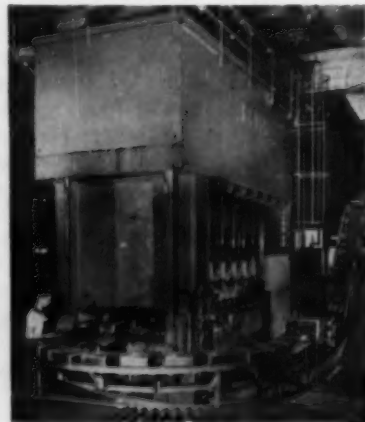
WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 125. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

fed into an 800-ton press for an embossing operation.

The design provides complete enclosure of working parts and controls. All air, electrical and lubrication controls are housed behind panels within the press uprights. Each press is essentially a straight side, single-action, double crank press. The frame is four-piece welded steel construction, keyed for accurate alignment and held by pre-shrunk steel tie rods.

Lubrication of the various wear surfaces is completely automatic, with two separate systems for the transfer feed yokes alone. Electrical interlocks in the lube lines shut down the press if lubrication is not at proper pressure.



12 pans per minute . . .



WHEN IT'S Special BOLTS and STUDS

Send your Specifications to

ERIE

40 years' experience in
making special bolts, studs,
nuts for specific job
requirements.



REPRESENTATION IN PRINCIPAL CITIES

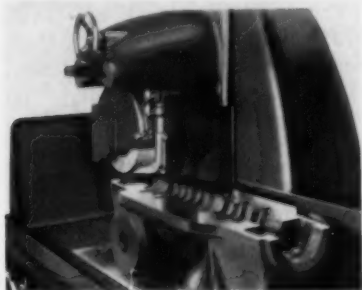
Grinding:

**Pump cases ground faster,
to finer finishes.**

High-pressure pump cases which were previously finish-planed, then hand-scraped in anywhere from 40 to 48 hr are now being processed in 3½ hr with a modern horizontal spindle surface grinder.

Mattison Machine Works, Rockford, Ill., reports pump cases come through grinding with a fine finish, accurate to within 0.0003-in. Also handled with dispatch by modern grinders, with tolerances held sufficiently close to eliminate any final hand scraping, are diesel engine blocks, split pump cases, split gear boxes and similar assemblies.

Where split assemblies must be provided with perfectly flat mating surfaces, they can often be ground to sufficiently close tolerances to make them pressure tight without use of gaskets.



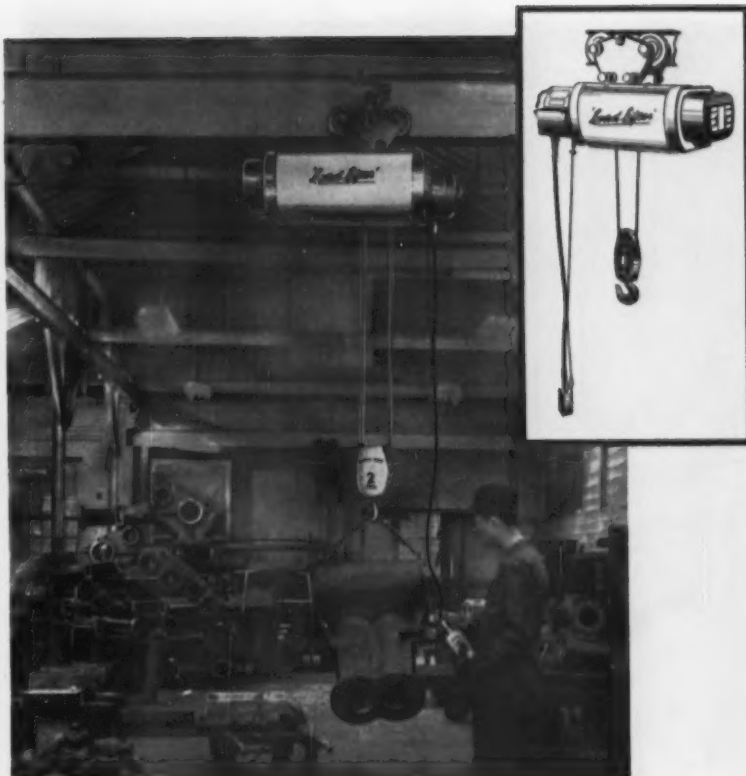
Faster finishing . . .

Fasteners:

**Let assembled cost
guide cap screw selection.**

Because assembly cost often counts more than the purchase price of the fastener, designers and purchasing agents should look to the assembled cost in selecting fasteners.

In selecting cap screws, for example, Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y., suggests comparing heat-treated and bright finish types on the basis of physical properties. Color of cap screws signifies their physical properties. Bright cap screws get their color and shiny appearance from cold working. For



QUICK TO LIFT... QUICK TO SAVE

Economy in load handling begins as soon as the Series "700" 'Load Lifter' Electric Hoist goes into service. It is the heavy-duty hoist recognized throughout industry for complete reliability and low operating cost on the toughest production lifting jobs.

Shorten handling time in your plant with the Series "700" 'Load Lifter'. It lifts one ton 30 feet a minute. It has every feature to safeguard man, load, and hoist — steel suspension, safety load hook, powerful synchronized motor and load brakes, concealed wiring, and only 24 volts at the push button. The strong, flexible wire rope makes nominal side lifts safe and easy.

Learn all about the rugged, smooth-operating Series "700" 'Load Lifter'. Capacities: ½-ton up. Single and two-speed control. Ask your "Shaw-Box" Distributor for details or get a copy of Bulletin 410.

'Load Lifter'®

ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN



Builders of "Shaw-Box" and "Load Lifter" Cranes, "Budgit" and "Load Lifter" Hoists and other lifting specialties. Makers of "Ashcroft" Gauges, "Hancock" Valves, "Consolidated" Safety and Relief Valves, "American" and "American-Microsen" Industrial Instruments, and Aircraft Products.



why some fork lift trucks lose their forks

On many materials handling operations, Towmotor job-planned accessories are more efficient than pallet forks. For example, this Towmotor Revolving Roll Clamp helped triple storage capacity by unloading, transporting and high-stacking paper rolls. Cost reductions of 85% in materials handling are not uncommon for Towmotor users . . . and these dollars saved become extra profit.

Complete information is available from your nearby Towmotor Sales Representative.
TOWMOTOR CORPORATION,
Div. 1509,
1226 E. 152nd St.,
Cleveland 10, Ohio.



**FORK LIFT TRUCKS
and TRACTORS**
SINCE 1919

TOWMOTORS are made only by TOWMOTOR CORPORATION

many purposes, with their close tolerances, accurate threads and excellent appearance, they are ideal.

Black Screw Uses

Black cap screws get their color — and their combination of strength and ductility—from their high-carbon content and from heat treatment. They afford greater toughness for jobs where high stresses will be met.

Heat-treated cap screws can stay tighter than bright cap screws. Holding power of a fastener depends on residual tension, which is dependent upon tensile strength. High-carbon heat-treated cap screws, having greater tensile strength, can be stressed much higher. If a joint is loosening, often the cure can be found in a black heat-treated cap screw tightened to set up correct residual tension.

Cost Is Relative

Though initial cost of heat-treated cap screws is greater, they can often cost less than bright ones, particularly if holding power is the important quality needed. For example, to obtain a safe working load of 20,000-lb, a $\frac{3}{4}$ -in. bright cap screw or a $\frac{5}{8}$ -in. black cap screw can be used. The smaller screw, heat-treated, costs less than the larger bright one.

Correct use of cap screws in designing new equipment often permits reduction in size and number of fasteners and holes, thus saving production time and increasing strength of the assembly.

Methods:

Linotype simplifies coding of electrical wires.

A Linotype machine has been added to aircraft manufacturing equipment at the Glenn L. Martin Co. Plant, Baltimore.

In today's aircraft, electrical and electronic systems use thousands of wires of many different types. Each wire must be coded by a printed number every few inches of its length. Linotype identifies these wires with sharp, clear char-

TECHNICAL BRIEFS

acters. New slugs are cast for printing each specific lot of wires.

Packaging:

**Fibre box ships
550-lb saw.**

Heavy weight, projecting parts and finely-machined steel mechanisms made the radial arm saw produced by Rockwell Manufacturing Co., Pittsburgh, a knotty packaging problem.

Formerly shipped in wooden crates, the tools were affected by dust and dirt which attacked moving parts after saws had been put into use. To avoid this problem, as well as lower first costs and shipping expenses, the company turned to the fibre box.

Four models shipped

Four saw models are shipped in the containers. Weight varies from 146- to 550-lb, but careful container design gives adequate strength without excessive weight.

The container body is made from 350-lb double wall board and end-caps are made from 275-lb single wall board. A double wall overlap box carries the necessary additional parts and scored sheets



Better packaging . . .

hold the saw and accessory boxes in position inside the container.

The new fibreboard pack permits easier and faster packing, provides space on container sides for advertising, and completely encloses the product. The fibre boxes may be stacked in warehouses, handled with fork-lifts and lend themselves to palletization.



Top Brass Says I'M GUILTY

In a way that's correct. Guilty of choosing the *wrong* protection. Fire hit and took off like lightning!

There's a moral to this: Protection that's good for one hazard can burn you out when applied to another.

That is why CARDOX years ago originated "Low Pressure Carbon Dioxide Systems"—to give safe protection to industry's "hot spots", for which existing protection just wasn't good enough. Since then thousands of CARDOX Systems have been installed for just about every kind of flammable liquid and electrical hazard you can think of—and scores of Class A hazards as well. *Fire savings to industry total up to many millions of dollars.*

CARDOX applies carbon dioxide as readily in *tons* as in pounds. Under the overwhelming attack of CARDOX CO₂ little fires are snuffed out instantly, big fires almost as fast.

CARDOX' unique experience in low pressure carbon dioxide is at your disposal. A survey of your hazards and our frank report costs you nothing—can be the first step toward turning fire in your plant into an incident instead of a disaster. Write us, please.



*Covered by Patents Issued & Pending

CARDOX

ORIGINATOR OF **Low Pressure CO₂**
FIRE EXTINGUISHING SYSTEMS

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS
Offices in Principal Cities



Cleveland Double Crank Double Action Toggle Press—400-ton capacity



Cleveland Single Crank Double Action Toggle Press—200-ton capacity

Cleveland Double Crank Double Action Toggle Press—200-ton capacity

YOU'LL HAVE fewer DEEP DRAW OR STAMPING rejects WITH Cleveland Toggle Presses!

The design of Cleveland Double Action Toggle Presses assures *smoothness of action, perfect timing and absolute dwell of blank-holder slide*. Powerfully constructed and having an ample over-load capacity, they consistently produce difficult deep drawings and stampings accurately. You'll enjoy their trouble-free operation and simplified maintenance. Adjustments are easy.

Cleveland Toggle Presses are designed so that when

the blank-holder toggle arms straighten out, the entire blank-holder pressure is transmitted to the frame. This permits total use of crankshaft power for the drawing operation.

Before you buy your next press, won't you let us give you the complete Cleveland story? We make 11 types of Cleveland Presses to assure utmost stamping economy. Just write or call today!

Why Settle for Less than a Cleveland Press



POWER PRESSER
FABRICATING TOOLS

E. 40TH & ST. CLAIR AVENUE • CLEVELAND 14, OHIO
Offices at: NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING • OXFORD, O.
CITY FOUNDRY DIVISION SMALL TOOL DEPARTMENT



NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 125 or 126



Semi-automatic grinder for precision sizing

A semi-automatic internal machine which can be used either as a conventional internal grinder or for automatic operation is adaptable to a high percentage of jobs found in the average plant. Two models are available, both having a 10-in. swing over the table and table travel 12 and 24 in. respectively. Three methods of table travel are available: hand feed for manual

operation; power feed by reciprocator, which is a lever arm mechanism. Standard in-feed is by hand-wheel, lead screw and nut; automatic operation is cam controlled. Spindle in-feed is a direct function of table reciprocation. Factors that affect rate of production and tolerances include hardness of material, grinding wheel used, finish required. *Parker-Majestic, Inc.*

For more data circle No. 35 on postcard, p. 125.

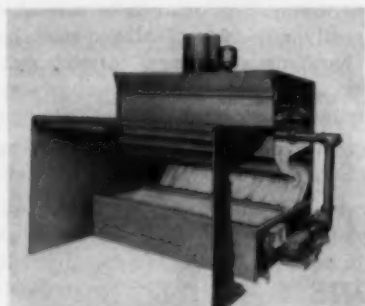
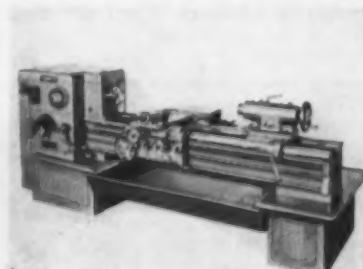
Greater production through increased swing, rigidity

Model 32 Dial-Matic engine and tool room lathes feature design changes to increase rigidity; greater bearing area is provided between the bed and motor and cabinet legs, the carriage ways and bed and the carriage and compound rest. Simple single dial control on all working units including headstock, gearbox

and apron lessens operator fatigue. Herringbone geared head type transmission is incorporated in these new models. All shafts in the headstock, gear box and apron are supported on anti-friction bearings.

Sidney Machine Tool Co.

For more data circle No. 36 on postcard, p. 125.



Water wash spray booth operates with high efficiency

New semi-elevated water wash paint spray booths are designed specifically for all production spraying. Improved design affords maximum protection against fire and explosion hazards. A heavy down flow of water falling on the back wash curtain creates a filtering point of entry through which

all paint particles must attempt passage before reaching the principle wash action process of the water chamber section. Through this process, much of the paint residue is knocked down and safely contained within the water reservoir tank. Available in a complete range of sizes. *M & E Mfg. Co.*

For more data circle No. 37 on postcard, p. 125.

Bor-Drill for precision drilling of deep holes

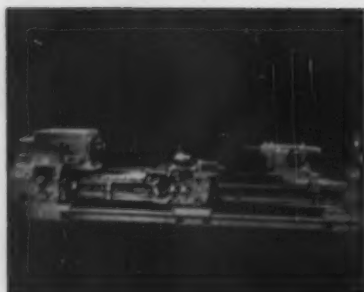
Bor-Drill method of drilling deep holes accurately, from the solid is a direct descendent of gun drilling. Precision limits are held for straightness, roundness, finish and diameter. Cored holes in castings can be finish-machined in one operation. The process is advantageous, not only for the high degree of accuracy and speed, but for convenience. The part to be

Bor-Drilled is clamped to a simple fixture and held stationary which means that the parts may be of any shape or size. Coolant is supplied under high pressure through the gun type drill. Many Ex-Cell-O machines have been designed especially for Bor-Drill applications. *Ex-Cell-O Corp.*

For more data circle No. 38 on postcard, p. 125.

Turn Page





More power permits heavy hogging cuts

The 32-in. engine lathe provides a full 75 hp for extremely heavy hogging cuts, removing metal at less cost. Increased horsepower calls for greater structural rigidity which is designed in the machine. A horsepower indicator allows the selection of feeds and speeds to utilize the maximum output of the motor. A 2-lever shift provides

easy, quick selection of spindle speeds. Gear box is totally enclosed and provides a selection of 81 feeds. A full range of threads may be cut from 1 to 30 tpi. Selection of any of these 30 threads or 81 feeds is made by a single lever and dial positioner in the gear box. *Axelsson Mfg. Co.*

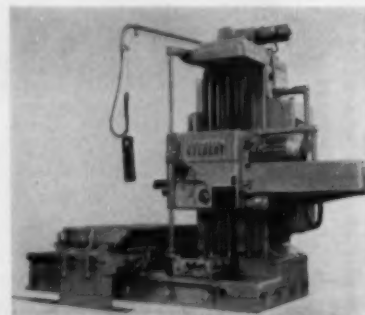
For more data circle No. 39 on postcard, p. 125.

Features pre-selective power shift of feeds, speeds

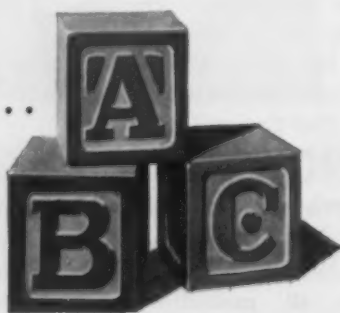
New high speed 4 and 4½ in. table-type horizontal boring, drilling, and milling machine features pendant-control and pre-selective power shift of feeds and speeds. During a cutting operation, feeds and speeds for the next operation can be selected. When the next cut is to be taken, the shift button is pressed, to shift the gears to those feeds and speeds. When the shift

button is pressed, the spindle stops, jogs while the gears are shifting, and then stops again. The machine, with spindle speeds up to 1500 rpm and built-in reversible motor without long shafts or bevel gears, is available with a wide range of column heights, table sizes, and bed lengths. *Cincinnati Gilbert Machine Tool Co.*

For more data circle No. 49 on postcard, p. 125.



as basic as . . .



Designed, developed and constructed for maximum versatility, **MAY-FRAN** conveyor components now provide users with the ultimate of flexibility. Pre-fabricated conveyor sections can be furnished rapidly and inexpensively. Sections can be assembled to form virtually any type of hinged-steel belt conveyor for handling stampings, formed metal parts, forgings, automotive scrap, chips and turnings and many other miscellaneous products.

Straight sections . . . concave or convex curved

Now you can buy **CUSTOMIZED** conveyors in pre-fabricated **STANDARD** sections

MAY-FRAN ENGINEERING, INC.

0070-MF

1698 Clarkstone Road



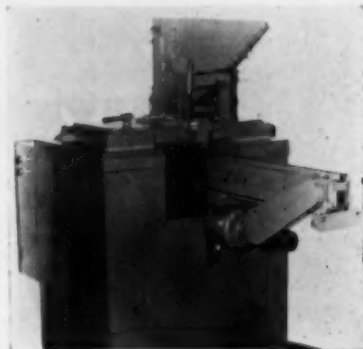
Cleveland 12, Ohio

Unitized perforating units reduce tooling costs

Trade named Unipunch, these perforating units have a maximum capacity of $\frac{1}{4}$ in. mild steel and are available in stock holder widths from 1 to $2\frac{1}{2}$ in., giving a perforating range from 0.093 to 1.500 in. Holder widths are narrow in relation to the maximum hole-size of each unit, and with the top-mounted stripping spring, close

hole-to-hole centers of perforations are possible. Features of the Unipunch units are a two-piece punch and small button die which are said to substantially reduce the cost of replacement parts. Advantage of Unitized Tooling is the ability to use a setup and re-use it in other combinations. *Punch Products Corp.*

For more data circle No. 41 on postcard, p. 125.



Automation for grinding, polishing operations

Combination adjustable shaft hopper and adjustable chain feed conveyor will provide automation for grinding and polishing operations. Hopper and conveyor are mounted on rollers on a floor stand, while the other end of the conveyor is rigidly bolted to the grinder. As the grinding wheel wears, the hopper and conveyor will be maintained in the correct relationship. For tandem

grinding setups, the conveyor is designed with special guide plates which present the parts to the grinder in a precise alignment, even though the grinders have unequal wheel wear. Hopper and conveyor will handle a range of sizes of shafts or any long cylindrical piece parts. *Kraus Design, Inc.*

For more data circle No. 42 on postcard, p. 125.

Turn Page

sections . . . take-up and powered end sections can be furnished to meet specific needs as pertain to conveyor belt width, physical limitations as well as required volume and load capacities.

Once installed, a MAY-FRAN conveyor can be dis-assembled and re-assembled in another plant location . . . quickly, easily and with minimum down-time. In addition, conveyors can be lengthened, shortened or modified in almost any way at minimum cost.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with standardized components for your customized installation.



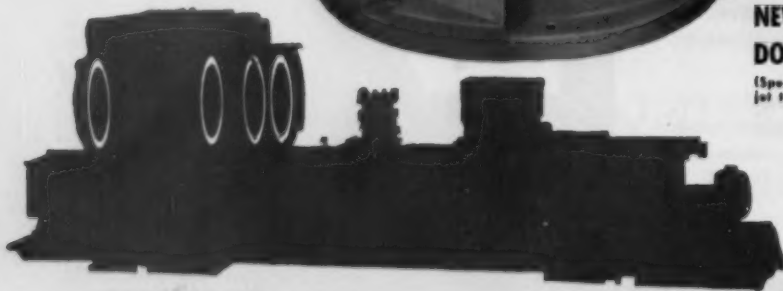
Write today for complete information.

PRECISION-GROUND



NEW 1800 SERIES DOUBLE HEAD GRINDER

(Specially equipped for grinding
jet turbine blades)



MACHINE TOOLS

Free Catalog!

For complete details on Frauenthal 1800
Series Double Head Grinders,
write for catalog.



Frauenthal Division

COMPONENTS . . .



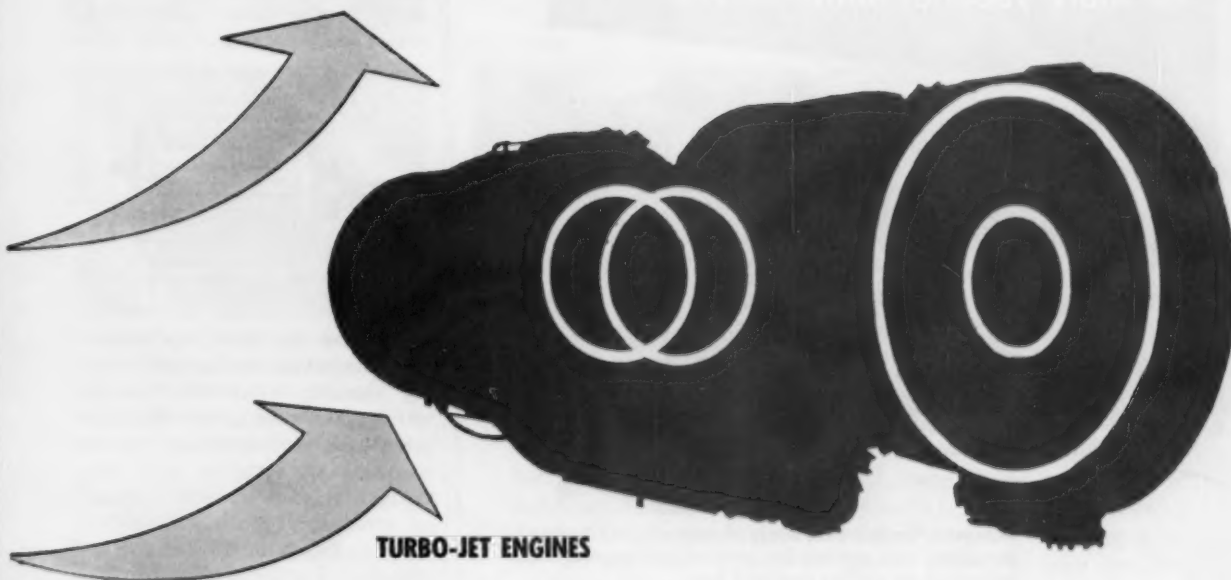
ORDNANCE

WHATEVER YOUR FIELD OF INDUSTRY — With Frauenthal precision machines, you're able to grind diameters and related surfaces without changing setup of the workpiece and obtain accuracies within .000200". This assures consistently uniform precision in concentricity, parallelism and roundness.

The accuracy and versatility of Frauenthal equipment is unequalled in the machine tool field. Difficult work-pieces — those impossible to handle on conventional horizontal grinding equipment — are handled with comparative ease on these unusual machines.

Four different series of machines are available affording table sizes up to 140". The 1800 Series Double Head Precision grinder, illustrated at left, is now available with a maximum swing of 72" and various table sizes to suit customer specifications.

For complete details, contact Frauenthal of Muskegon, Michigan.



TURBO-JET ENGINES

MACHINE TOOLS — Modern day machine tools are required to produce piece parts to greater accuracy than ever before. Therefore, machine tool components must be more precise to the nth degree. With Frauenthal grinders you can grind collets, chucks, spindle sleeves and similar components under simulated assembly conditions to assure concentricity, parallelism and roundness. Eliminate costly and time consuming hand scraping and grind plated parts prior to and after plating for increased wearability.

TURBO-JET ENGINES — Diffuser cases, rotors, compressor discs, vanes, etc., are components of jet engines ground on

Frauenthal equipment. Thin section parts, which are unstable due to their design, are ground on the horizontal rotary table of the 1800 and 3100 Series machines. The compound and spindle angle setting features permit the grinding of surfaces normally inaccessible on conventional equipment.

ORDNANCE — Large bearings and housing components for ordnance applications are ground on the 1800 and 2200 Series grinders. Applications vary from aircraft gun turret bearings to the large turret bearings required for tanks, motorized gun carriages, radar and naval gun mounts.

THE KAYDON ENGINEERING CORP.
MUSKEGON, MICHIGAN



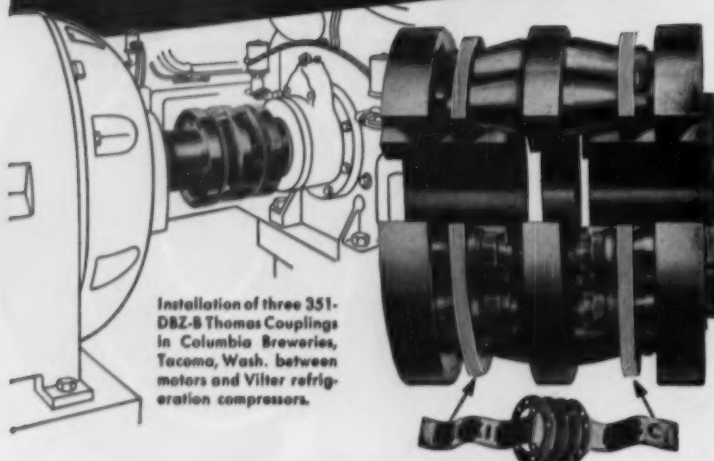
High speed production in slitting screw heads of all types is accomplished with a new machine. Completely automatic, the machine is equipped with a hopper that automatically feeds screws to a multi-station indexing plate, where they are clamped for transfer to a circular cutter. After slitting at the cutter, the screws are automatically

Slitting screw heads speeded up

ejected and the plate continues indexing for reloading. Timing of the indexing plate is mechanically coordinated with slitting time. Capacity of the machine is up to 50 screws per min, ranging in sizes of 0.100 in. diam x 1/4 in. long to 1/4 in. diam up to 2 3/4 in. long. *Hal-ler, Inc.*

For more data circle No. 43 on postcard, p. 125.

THOMAS FLEXIBLE COUPLINGS... for more years of better service!



Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

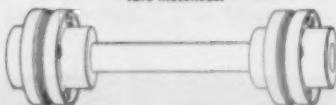


Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

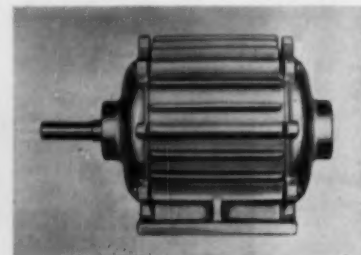


Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Fan-duty motors

A new line of totally enclosed fan-duty motors, Type EFD, in ratings of 1/4 to 20 hp incorporates features that contribute to extra-long maintenance-free life. These include double width prelubricated sealed ball bearings; deep, inte-



grally cast fins providing greater heat dissipating surface and allowing smaller transverse section which contributes to fan efficiency; extra-margin windings having double-heavy formvar wire providing high dielectric and mechanical strength; optional connection boxes to fit any air-over-motor application. *Lima Electric Motor Co.*

For more data circle No. 44 on postcard, p. 125

Primer for magnesium

A primer for magnesium has been developed to check electrolytic decomposition in assemblies where magnesium is jointed to less active metal. Designated as 40X-675, the primer also resists the solvent action of hydraulic fluids in aircraft. It can be sprayed or dipped and has fast-drying characteristics which speed production. It can be applied directly either to untreated or to chemically treated magnesium. A film thickness of 1 1/2 mils is said to provide long lasting salt spray resistance. *Stanley Chemical Co.*

For more data circle No. 45 on postcard, p. 125.

NEW EQUIPMENT

Copying lathe

A completely hydraulic copying type lathe used to machine smaller parts in single or production quantities has an 11-in. swing, 17 in. between centers and 13 in. carriage travel. The duplicator cross feed is 1½ in. and the machine incorporates a spindle drive by a coun-



tershaft clutch brake assembly designed for instant starts and stops. An air operated collet closer and tailstock work from a single selector valve. *Elgin Tool Works.*

For more data circle No. 46 on postcard, p. 125.

Dewpoint controller

New low cost, automatic controller provides a simple, economical means of automatically controlling the dewpoint of an atmosphere generator, or a heat treat furnace. It is applicable to processes such as gas carburizing, clean hardening



and annealing, etc., where a permanent record is not required. The Autocarb controller is a completely self-contained unit and operates with an electronic control system using a resistance bulb as sensing element. Signal lights provide high and low dewpoint indication. *Surface Combustion Corp.*

For more data circle No. 47 on postcard, p. 125.

Turn Page

September 22, 1955



A GAGE'S PRICE IS THE SMALLEST PART OF ITS TOTAL COST!

The cost of a gage is its price *plus* cost of gaging time *plus* costs of rework and scrap that appear in spite of the gage's use. For example: our booklet "A Management Blind Spot" reports how a \$10.00 plug gage made in a toolroom actually cost \$3800 a year. The \$165 Federal dial indicating bore gage that replaced it cost only \$825 a year.



WHY DOES THIS NEW FEDERAL HOLE GAGE "COST" SO LITTLE?

It reduces rework and scrap because operators *see* every diameter accurately magnified (*not* approximately). Compared with other dial-indicating gages, it prevents more off-size work from getting by. Its extreme sensitivity detects minor deviations from specified tolerances which other gages do not even show up. It can do the work of more costly air gages except in only a few rare cases. No wonder it "costs" so little!

COMPARE "HIDDEN COSTS" OF GAGES BEFORE YOU BUY!

It pays to look at all the facts behind a gage's price tag. Our free booklet, "A Management Blind Spot" shows you how to tell the difference between gage price and cost. Write for your copy today. Better still, why not have a Federal gage engineer give you specific gage recommendations?

FEDERAL PRODUCTS CORPORATION
Dept. 15H Providence 1, R. I.

Ask **FEDERAL**
FOR MODERN GAGES AND GAGING TECHNIQUES...

Dial Indicating, Air, Electric, or Electronic — for inspecting, measuring, sorting, or automation gaging

Perforations perplexing you?

MASONITE
METAL
PLASTIC?
RUBBER?



...better call HENDRICK

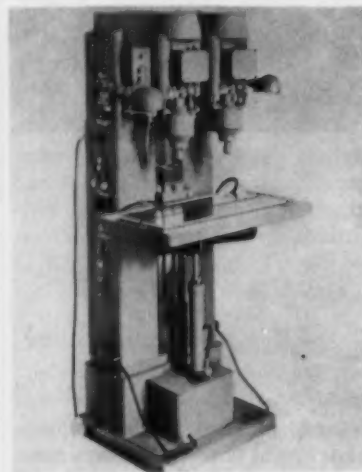
Hendrick
MANUFACTURING COMPANY

37 DUNDAFF ST., CARBONDALE, PA. • Sales Offices in Principal Cities
Perforated Metal • Perforated Metal Screens • Wedge-Slot and Wedge Wire
Architectural Grilles • Milco Open Steel Flooring • Shur-Site Treads • Armorgrids

If you have a design problem that's got you down maybe Hendrick can be of help. Sometimes the easiest and quickest way to enhance a product's beauty is to include a pleasing pattern of perforations in its design. Hendrick perforated metal not only helps increase a product's overall attractiveness, but also adds to its saleability as well. And whatever material you're using . . . whether it's metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes, you can draw on Hendrick's long experience and perforating facilities to fill the bill. Write for details.

Facilitate automaticity

Completely redesigned full universal drilling, tapping and threading machines include single-spindle, vertical machines and two-spindle, vertical combination machines. To further facilitate automaticity of operation and greater flexibility, new transfer and selector controls have been added to simplify setup and increase the range of adaptation. Thirty-five different types of air-operated indexing and clamping fixtures are available. The air-operated work table, self-contained



lubricant pump system, automatic belt-tensioning device, and precise limit switch controls, when used in conjunction with the sensitive air-pressure and feed arrangements, minimize the human element and provide a constancy of operation. *Snow Mfg. Co.*

For more data circle No. 48 on postcard, p. 125.

USER SAYS TAP LIFE UP 43%
ON THIS THIN-WALLED CASTING



... thanks to
FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE . . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 46, Niagara Falls, N.Y. 64-12

CARBORUNDUM®

**LET'S
FACE IT!**

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**THE
MILFORD
RIVET & MACHINE CO.**

Plants: Milford, Conn.; Norwalk, Calif.; Elyria, Ohio; Aurora, Ill.; Hattboro, Pa.
Offices: Atlanta, Chicago, Cleveland, Detroit, Fort Worth, Indianapolis, Newark, New York, Pittsburgh, Racine, St. Louis, St. Paul, San Francisco, Seattle, and Norwalk, Calif.; Stratford, Conn.; Charlotte, N. C.; Seneca Falls, N. Y.; Jenkintown, Pa.; Westwood, Mass.

Headquarters for RIVETS
Tubular, split and special cold-formed
and Rivet-setting Machines

Cleans the way

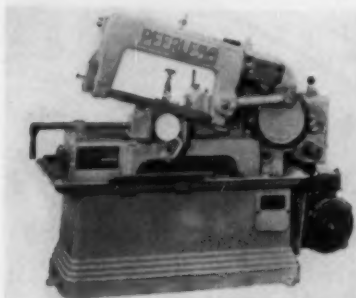
Used in wiping applications when high quality finishes are to be applied, the new Tac-All tack cloth is said to remove all foreign dust and grit particles to pave the way for flawless additional finishes. The tack substance used to impregnate the cloth resists drying indefinitely and offers no danger of spontaneous combustion. All dirt and dust particles are absorbed into the cloth by the tack substance after a single pass with the cloth. *George W. Renner Co.*

For more data circle No. 49 on postcard, p. 125.

NEW EQUIPMENT

Metal sawing machine

This Speedy-cut is an accurate, rugged 2 or 3 speed general purpose metal sawing machine, with 6 x 6 in. capacity. A compensating feeding mechanism automatically adjusts itself to the size and shape of the work. The feed adjustment hand wheel works in conjunction with an



indicator on a graduated scale located on the front of the machine for convenience of the operator. Rugged, machined vise jaws hold the work firmly eliminating chatter during the cutting operation. Husky U-type saw frame holds the saw blade with such rigidity that blade life is longer and cuts are said to be straighter and smoother. *Peerless Machine Co.*

For more data circle No. 59 on postcard, p. 125.

Tool holder

This new tool holder provides the flexibility of the standard yoke type tool holder, but combines with it the rigidity of the conventional



open side. One tightening of the wrench locks the tool bit and tool block securely in place. The tool rocker allows maximum convenience in making adjustments of the $\frac{3}{8}$ in. square tool bits. *Wade Tool Co.*

For more data circle No. 51 on postcard, p. 125.

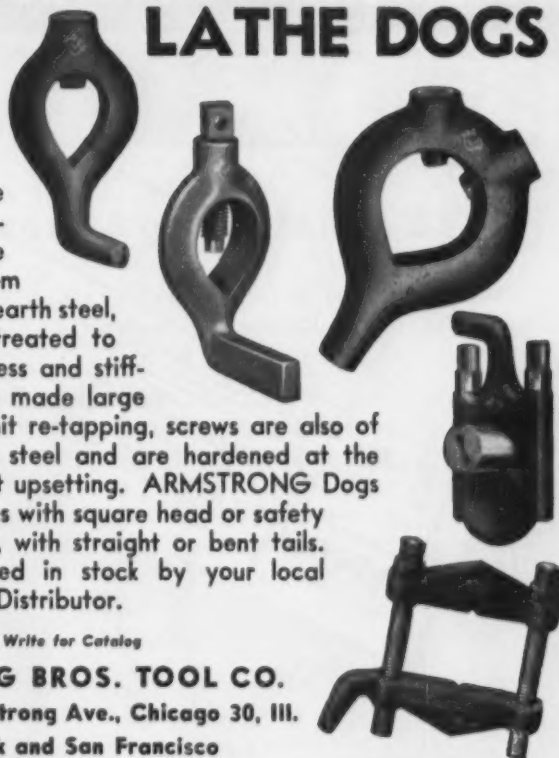
ARMSTRONG *Drop Forged* LATHE DOGS




ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head or safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

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DO YOU HAVE "A Guide to Specialty Steels as Made by Carpenter"?

It is designed to give you a quick summary of the products Carpenter supplies to industry. Because of the high standards to which these steels are made, you may find new ways to cut costs, increase production or improve your own products.

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Ever since Carpenter developed the first free-machining stainless, industry has applied Carpenter Stainless in its search for new opportunities for improvement.

One example is a new freedom from corrosion problems... made possible by the development of Carpenter No. 20, a hot sulphuric acid resisting stainless steel. Another is the economical, mass-production of severely cold headed chrome-nickel parts with Carpenter-pioneered Stainless No. 10.

Still another is found in industry's

search for more dependable steels to meet the demands of high temperature applications. In this field of super alloys, too, Carpenter is producing heat resisting alloys to established standards of Carpenter quality.

And consider this: Carpenter quality is safeguarded by one of the largest staffs of skilled metallurgists, per pound of steel produced, in the industry. Discover how you can explore new horizons of product and production improvements today... by moving to Carpenter.

Carpenter STEEL

Corrosion and Heat Resisting Steels

THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

The Iron Age SUMMARY . . .

Steel mills are roaring toward an all-time production year . . . Indications are 155 million tons will be produced . . . Incoming orders still heavy.

New Production Record . . . It's a good bet that 1955 will be an all-time production year for steel. The mills are really beginning to roll again after several months of frustration by maintenance, weather, and vacations.

Chances are that ingot output for the year will approach 115 million tons, compared with the previous record of 111.6 million tons established in 1953.

More and more plants are scheduling—and maintaining—production rates in excess of 100 pct of capacity. The national ingot rate has been inching up steadily.

Mills On A Treadmill . . . It is a killing pace for the mills. Maintenance is on a catch-as-catch-can basis. When a mill or a furnace breaks down it's repaired as quickly as possible and put back into production. But major maintenance is out of the way, at least for the time being.

But despite their best efforts, the mills know they're on a treadmill. They take one step forward only to be set back two steps. Incoming orders continue to run in excess of capacity—from 110 to 120 pct of capacity. If producers accepted all the business offered, the ratio would be 130-150 pct.

With 1955 already in the bag, producers and consumers are thinking anxiously about 1956. It's something to worry about. Major consuming industries are making plans for another big year. Automotive will be setting the pace.

More of Same In '56 . . . While producers have not generally opened order books for 1956, the question is academic. When the time comes, steel customers will be told what they can expect—not what they would like to get.

Meanwhile, the mills are doing the best they can to keep the customers from getting hurt. Strict allocations are part of the program. It seems to be working out in most cases, although the situation in at least one product—plates—is just about impossible.

Also, many normal mill customers have had to buy warehouse steel to keep from running short. This has placed an unusually heavy burden on the warehouses at a time when their own customers are pressing them for delivery.

Apparently, though, few customers have had to resort to costly conversion of gray market. There probably is a little of both but not of real significance. A premium-price export deal involving hot-rolled bands is the latest reported.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,316	Last Week 2,316	Month Ago 2,196	Year Ago 1,653
Ingot Index (1947=1949=100)	144.0	144.0	136.5	103.0
Operation Rates				
Chicago	96.0	97.5	95.5	68.5
Pittsburgh	99.0	97.0	95.0	67.0
Philadelphia	97.0	98.0	81.0	58.0
Valley	97.0	96.0	93.0	57.0
West	97.0	93.0*	97.0	84.0
Detroit	92.0	94.0*	47.0	84.0
Buffalo	102.0	105.0	100.0	56.5
Cleveland	100.0	100.0*	95.0	75.0
Birmingham	96.0	96.0	95.0	75.0
S. Ohio River	85.0	87.0*	90.0	79.0
Wheeling	99.0	100.0	95.0	93.0
St. Louis	92.0	106.0	104.0	69.0
Northeast	95.0	96.0	81.5	46.0
Aggregate	96.0	96.0	91.0	68.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.801
Pig Iron (Gross ton)	\$59.05	\$59.09	\$59.09	\$56.59
Scrap, No. 1 hvy (gross ton)	\$44.17	\$44.17	\$43.83	\$30.17
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	22.20
Copper, electrolytic	43.00	43.00	40.00	30.00
Lead, St. Louis	14.80	14.80	14.80	14.55
Magnesium, ingot	29.25	29.25	29.25	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	97.00	97.25	96.00	93.625
Zinc, E. St. Louis	13.00	13.00	12.50	11.50

Inflation Hits Ferroalloys

Questionable whether rise in ferroalloy prices will affect steel products . . . Electro Metallurgical Co. makes first boost in several years . . . Market strong.

◆ IT'S QUESTIONABLE whether higher prices for ferroalloys will result in compensating price boosts in affected steel products. Nevertheless, some steel producers are holding off on a definite statement one way or the other.

The first general increase in ferroalloy prices in several years was announced by Electro Metallurgical Co. On a weighted average, the boost amounts to 5.3 pct. It affects spot purchases immediately, contract buyers Oct. 1.

Specific increases include high-carbon ferrochrome, both regular and low-chromium grades, up 1½¢; low-carbon ferrochrome in all grades up to and including 0.50 pct carbon, up 2¢; low-carbon ferrochrome in 1.00 pct, 1.50 pct, and 2.00 pct maximum carbon grades, up 1¢; "Simplex" low-carbon ferrochrome in all grades, up 1¼¢; chromium metal, both regular and electrolytic grades, up 9¢; ferro-silicon-chrome, 2¢; foundry ferro-silicon-chrome, 1¢; and exothermic ferrochrome and exothermic silicon-chrome, 2¢.

Ferrochrome-silicon is increased an amount equivalent to the increase in high-carbon ferrochrome for the chromium content and equivalent to the increase in 50 pct ferrosilicon for the silicon content, but the material will hereafter be sold on the basis of chromium content only. The new base price becomes 39.05¢ per lb of contained chromium.

Among the manganese alloys, medium-carbon ferromanganese is increased by ½¢, low-iron ferromanganese by 2¢, and Manganese alloy by 1¢.

The increase in 50 pct ferro-silicon amounts to ¾¢ per lb of contained silicon and in the low-aluminum grade to ¼¢. Silico-

manganese is increased by 2/10¢ per lb in all grades. In addition to these increases, these products will hereafter be sold on an f.o.b. shipping point basis rather than on a delivered basis to bring them into line with long established practice on standard ferromanganese.

In addition, increases in the packing differential for all products sold both bulk and packed will be about \$5.00 per net ton of material.

SHEETS AND STRIP . . . In Detroit, the word is that for all intents and purposes sheets are sold out through first quarter although books have not been officially opened as yet. And in Pittsburgh, some mills reportedly are unofficially committed beyond first quarter; deliveries are running 8 to 10 weeks behind promises. The same tight situation prevails in both Cleveland and Chicago.

BARS . . . Consumers who depend on Pittsburgh mills are beginning to worry about their 1956 allotments. They're clamoring for producers to give them an inkling of what to expect; chances are the news will be unfavorable, since carryovers into the new year continue to build up. Pressure is strong in Detroit, particularly for hot rolled carbon bars. In Chicago, major producers are advising consum-

ers there will be a carryover into at least part of January on popular sizes and grades of both hot-rolled and cold-finished bars.

PLATES . . . In Chicago, deliveries are running 10 to 12 weeks compared to a normal 6 to 8 weeks; situation is especially tight on light gage plate. The big Whiting, Ind., refinery repair job is absorbing emergency tonnages that will total over 10,000. Some 59 demolished or damaged oil tanks must be replaced and repaired. Deliveries in Detroit are 6 to 8 weeks behind schedule; maintenance shutdown of a large midwestern mill compounded the problem.

STRUCTURALS . . . It looks like highway and building construction will roll along into 1956 at a high level. Chicago reports carryovers into the New Year will run 6 weeks on both wide flange and standards. In Detroit, wide flange beams are still the tightest item on the list. The outlook in Pittsburgh is just as pessimistic. The word there is that chances are construction will continue into 1956 but even if it doesn't, builders will use the time to rebuild inventories for the spring pickup.

TUBULAR PRODUCTS . . . Chicago producers report their order books are filled for fourth quarter on seamless; 1956 business is there but formal orders are not being taken as yet. In Pittsburgh, oil country goods carryovers will be strong into 1956, with mechanical tubing just a step behind. Both lamp and butt-weld pipe are relatively easier, with some tonnage available for November delivery.

WIRE PRODUCTS . . . A gradual seasonal pickup in merchant wire is beginning to make itself felt. In Chicago, a large producer is quoting November-December delivery on spring wire. Detroit reports that manufacturers' wire is in tight supply; fourth quarter is sold out and producers are beginning to worry about carryovers into 1956.

WAREHOUSE . . . Warehouses generally are suffering from reduced allocations and delayed deliveries from the mills. One large distributor in the Chicago area reports that 500 tons of plates scheduled for delivery in October already has been pushed back to November. The warehouses are running short on hot and cold rolled sheets. And their inventories generally are declining.

Purchasing Agent's Checklist:

GOVERNMENT: How will 1956 politics affect you?	p. 63
STEEL: Complex labor problems lie ahead	p. 67
AUTOS: Detroit plans more than 7 million	p. 77
PACKAGING: Aluminum foil stimulates markets	p. 66

Comparison of Prices

(Effective Sept. 20, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Sept. 20 1955	Sept. 13 1955	Aug. 23 1955	Sept. 21 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.825	5.825	5.825	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.25	6.25	6.25	5.82
Plate	4.92	4.92	4.92	4.92
Plates wrought iron	9.30	9.30	9.30	9.30
Stain's C-R strip (No. 302)	44.50	44.50	44.50	41.50
Tin and Terplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. terms	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.312¢
Cold-finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	58.25	51.25	58.25	55.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	\$4.725	\$4.725	\$4.725	\$4.45
Light rails	5.65	5.65	5.65	5.35
Semi-finish Steel: (per net ton)				
Re-rolling billets	\$68.50	\$68.50	\$68.50	\$64.00
Slabs, re-rolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp. (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composites: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.801¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Sept. 20 1955	Sept. 13 1955	Aug. 23 1955	Sept. 21 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$62.60	\$62.60	\$62.60	\$61.19
Foundry, Valley	60.00	59.50	59.50	58.50
Foundry, Southern, Ch'ti	61.50	61.50	61.50	59.43
Foundry, Birmingham	58.00	58.00	58.00	55.58
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.37
Basic, Valley furnace	58.50	58.50	58.50	56.00
Mallenble, Chicago	59.00	59.00	59.00	56.50
Mallenble, Valley	59.00	59.00	59.00	56.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	\$59.00	\$59.00	\$59.00	\$56.50
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$44.50	\$44.50	\$44.50	\$31.50
No. 1 steel, Phila. area	46.50	46.50	46.50	38.50
No. 1 steel, Chicago	41.50	41.50	41.50	30.50
No. 1 bundles, Detroit	39.00	39.00	39.00	25.00
Low phos., Youngstown	47.50	47.50	47.50	38.50
No. 1 mach'y cast, Pittsburgh	46.50	46.50	46.50	42.50
No. 1 mach'y cast, Philadel'a.	47.50	47.50	47.50	41.00
No. 1 mach'y cast, Chicago	53.50	53.50	53.50	42.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$44.17	\$44.17	\$43.83	\$30.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$18.25	\$18.25	\$18.25	\$16.50
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	40.00	30.00
Copper, Lake, Conn.	43.00	43.00	38.00	30.00
Tin, Straits, New York	97.00	97.25	96.00	93.625
Zinc, East St. Louis	13.00	13.00	12.50	11.50
Lead, St. Louis	14.80	14.80	14.80	14.55
Aluminum, virgin	28.25	28.25	28.25	22.40
Nickel, electrolytic	67.67	67.67	67.67	65.65
Magnesium, ingot	39.25	39.25	39.25	17.75
Antimony, Laredo, Tex.	53.50	53.50	53.50	58.50

† Tentative. ‡ Average. * Revised.

PIG IRON

Dollars per gross ton, f.o.b. subject to switching charges.

← To identify producers, see Key on P. 155 →

Producing Point	Basic	Fdry.	Mall.	Bees.	Low Phos.
Bethlehem B3	60.50	61.00	61.50	62.00	.....
Birdsboro, Pa. B6	60.50	61.00	61.50	62.00	.....
Birmingham B3	54.50	55.00	55.50	56.00	.....
Birmingham W9	54.50	55.00	55.50	56.00	.....
Birmingham U4	54.50	55.00	55.50	56.00	.....
Buffalo B3	58.50	59.00	59.50	60.00	.....
Buffalo H1	58.50	59.00	59.50	60.00	.....
Buffalo W6	58.50	59.00	59.50	60.00	.....
Chester C17	54.50	55.00	55.50	56.00	.....
Chicago I4	58.50	59.00	59.50	60.00	.....
Cleveland A5	58.50	59.00	59.50	60.00	.....
Cleveland B3	58.50	59.00	59.50	60.00	.....
Duquesne L3	58.50	59.00	59.50	60.00	.....
Duluth I4	58.50	59.00	59.50	60.00	.....
Erie I4	58.50	59.00	59.50	60.00	.....
Everett A6	64.50	65.00	65.50	66.00	.....
Fontana K1	64.50	65.00	65.50	66.00	.....
Geneva, Utah C7	58.50	59.00	59.50	60.00	.....
Granite City G2	60.40	60.90	61.40	61.90	.....
Hubbard Y1	.....	.....	.....	.....	.....
Lucas Star L3	55.00	55.50	56.00	56.50	.....
Minneapolis C6	60.50	61.00	61.50	62.00	.....
Monessen P6	58.50	59.00	59.50	60.00	.....
Neville Is. P4	58.50	59.00	59.50	60.00	.....
N. T. Youngstown T1	58.50	59.00	59.50	60.00	.....
Pittsburgh U1	58.50	59.00	59.50	60.00	.....
Sharpsville S3	58.50	59.00	59.50	60.00	.....
So. Chicago B3	58.50	59.00	59.50	60.00	.....
Steelton B3	60.50	61.00	61.50	62.00	66.50
Swadeland A2	60.50	61.00	61.50	62.00	.....
Tolado I4	58.50	59.00	59.50	60.00	.....
Troy, N. Y. B3	60.50	61.00	61.50	62.00	66.50
Youngstown Y1	.....	.....	.....	.....	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.80 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, 82¢ per ton for 0.75 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel.

Silvery Iron: Buffalo, H1, \$68.75; Jackson, J1, G1, \$47.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferro-silicon prices are \$1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	348	410	416	430
Ingot, re-rolling	17.75	19.00	—	20.25	31.00	25.00	33.75	15.00	—	15.25
Slabs, billets, re-rolling	22.25	24.75	26.75	28.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, dis. blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	35.75	51.25	36.25	51.00	25.50	28.00	28.00
Bars, wires, structurals	38.00	38.25	41.00	42.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	32.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	50.25	44.25	59.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	69.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J3; Baltimore, Md., U1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, Ind., Philadelphia, D5.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C3; Washington, Pa., W2; W. Lechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (.25¢ per lb. higher); W1 (.25¢ per lb. higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C3; Thruville, Pa., U3; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3; Ft. Wayne, Ind., Philadelphia, D3; Detroit, R5.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C13; Philadelphia, D5.

Forged discs, dis. blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J3.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J3; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5.

Prices Hold in Spotty Market

Mill-broker stalemate leaves Pittsburgh market at a standstill . . . Chicago reports limited activity . . . New buying due in the East . . . Composite unchanged.

◆ **RESISTANCE** of mills to prices and refusal of brokers to take orders at reduced figures added up to a sluggish market in Pittsburgh.

Similar conditions are retarding activity in other centers. In the East, a leading mill has held off orders for No. 1 heavy melting for something like a month. Brokers in this area look for entry of the mills for the best grades any day. They can't see the current buying lag continuing in the face of high operating rates.

In this same area brokers have avoided any buildup of scrap. Like the mills, they are reluctant to accumulate stocks at today's healthy prices. This hesitation—at both the mill and dealer levels—could result in a real supply pinch going into the winter months.

Reflecting a strong, steady market, **THE IRON AGE** composite for No. 1 heavy melting steel scrap remained unchanged at \$44.17.

Pittsburgh . . . Consumers and brokers are at loggerheads. Result is that the market is at a standstill. Brokers claim they cannot buy from dealers at a price that would justify their selling to the mills at below current levels. The mills are just sitting tight. Railroad specialties advanced \$1 per ton following the most recent transaction. Machinery and heavy breakable cast are up on the basis of latest sales.

Philadelphia . . . Foundry grades showed new strength, with out-of-town prices drawing scrap from the area and malleable advancing \$4. New buying moved railroad steel wheels and spring steel up \$1. Otherwise, the area market is strong but quiet. A leading mill is expected to come for tonnage requirements of the best steel-making grades shortly but right now, most new buying is for the weekly

needs for smaller consumers. There are no large accumulations of scrap in the area. The mills have held off inventory buying. Dealers are working on a fast turnover, meeting current needs and avoiding any buildup. Export continues steady. A boat was loaded this week and brokers say there is never any trouble moving scrap on the export market.

Chicago . . . Price levels in all major steelmaking grades are holding firm in a stronger broker's market with most quotations reported active at those figures. Indications are that the firm market of the past several weeks will hold or perhaps make slight advances in the immediate days ahead. With major mill scrap inventories reported at a good level, mill purchases are currently moving on limited tonnage orders with some resistance to prices on the part of mill buyers reported. Indications are, however, that if necessary, mills may up the ante on current major steelmaking price levels in order to maintain their good position with respect to scrap inventories. Some selective buying in No. 1 factory bundles at several dollars above current listings is reported.

New York . . . Prices held firm in a strong, peppy New York market. Brokers are looking for the entry of a leading mill to confirm or advance prices. Feeling is that important new buying has got to come soon, as mill inventories go down, and brokers can't see anyone parting with scrap at reduced figures.

Detroit . . . The market entered a period of watchful waiting this week as both dealers and brokers began thinking in terms of the October auto lists. The lists begin coming out next week and little change in prices is expected. Although the amount of automotive scrap will increase next month, market observers believe that the mills are going to be forced into buying scrap in order to maintain

record production. Also, a Canadian mill's order for additional scrap will help absorb any surplus in the area.

Cleveland . . . A Valley mill bought a tonnage of No. 1 busheling at \$47, substantiating the prevailing price for open hearth grades in the district. A Cleveland consumer made a small purchase of No. 1 and No. 2 heavy melting at no change in existing prices. Blast furnace grades moved up 50¢ in Cleveland on the basis of a sale. The market undertone continues strong, amid reports of precarious mill inventories.

Birmingham . . . Higher prices offered last week have brought a fairly good flow of openhearth scrap to the mills, but some dealers are limiting shipments in the belief a still further increase is in the offing. Higher prices for cast also brought out a reasonably good movement, but dealers say the supply is still tight, with movements into the yards slow.

St. Louis . . . Railroad list of 125 carloads, including 60 carloads of No. 1 RR heavy melting steel, brought an advance of \$1 a ton to that item and to locomotive tires uncut, angles and splice bars, standard steel car axles, railroad specialties, and cast iron car wheels. Heavy buying by foundries was a factor in the advance. Malleable is up \$4.50 a ton.

Cincinnati . . . Low phos jumped \$3 per ton this week on basis of a sale, creating a broker's price of \$48. Otherwise the market is inactive, with openhearth moving on the basis of sales previously mentioned. Rail market continued strong.

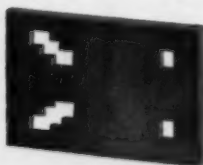
Buffalo . . . No. 1 heavy melting steel held unchanged this week despite a drop of \$1 per ton in No. 2 steel and No. 2 bundles. The declines were based on substantial purchases by top consumers. Blast furnace grades also were off \$1 per ton.

Boston . . . Market remains on the quiet side here with no new buying by Pittsburgh and eastern Pennsylvania mills. No. 1 steelmaking grades were strengthened a little by local buying and these grades are tight but activity generally continues to lag.

West Coast . . . Heavy exporting continues from San Francisco, Los Angeles, and Seattle—and the mills are as unhappy as ever about it. Supply is getting tighter all the time.



FLAME-CUT



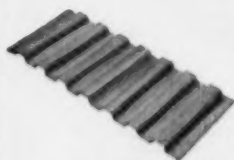
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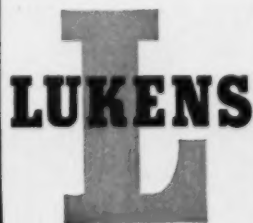
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ventories and free men and machines for other jobs.

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A Division of Lukens Steel Company, Coatesville, Pennsylvania

Scrap Prices (Effective Sept. 20, 1955)

Pittsburgh

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and ma. turn.	29.00 to 30.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'g. plate	48.00 to 49.00
Heavy turnings	48.00 to 49.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgh.	50.50 to 51.50
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	52.50 to 53.50
RR. spring steel	52.50 to 53.50
RR. couplers and knuckles	52.50 to 53.50
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	38.00 to 39.00

Chicago

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 factory bundles	44.00 to 45.00
No. 1 dealers' bundles	41.00 to 42.00
No. 2 dealers' bundles	31.00 to 32.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'g. plate	48.00 to 49.00
Low phos. 3 ft and under	45.00 to 46.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgh.	52.00 to 53.00
Rerolling rails	65.00 to 66.00
Rails 3 ft and under	58.00 to 59.00
Locomotive tires, cut	48.00 to 49.00
Cut bolsters & slide frames	49.00 to 50.00
Angles and splice bars	55.00 to 56.00
RR. steel car axles	54.00 to 55.00
RR. couplers and knuckles	50.00 to 51.00
No. 1 machinery cast.	52.00 to 53.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	39.00 to 40.00
Cast iron brake shoes	38.00 to 39.00
Cast iron car wheels	45.00 to 46.00
Malleable	53.00 to 54.00
Stove plate	39.00 to 40.00

Philadelphia Area

No. 1 hvy. melting	\$46.00 to \$47.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	27.50 to 28.50
Mixed bor. short turn.	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Shoveling turnings	30.00 to 31.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 3 ft and under	48.00 to 49.00
Low phos. punch'g. plate	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	50.00 to 51.00
RR. spring steel	50.00 to 51.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	38.00 to 40.00
Heavy breakable cast.	45.00 to 46.00
Cast iron car wheels	51.00 to 52.00
Malleable	57.00 to 58.00
Unstripped motor blocks	29.00 to 31.00
No. 1 machinery cast	47.00 to 48.00

Cleveland

No. 1 hvy. melting	\$42.50 to \$44.50
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	43.50 to 44.50
No. 2 bundles	35.00 to 36.00
No. 1 busheling	43.50 to 44.50
Machine shop turn.	24.50 to 25.50
Mixed bor. and turn.	27.50 to 28.50
Shoveling turnings	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Cut struct'l & plate, 2 ft & under	42.00 to 43.00
Drop forge flashings	42.00 to 43.00
Low phos. punch'g. plate	44.00 to 45.00
Foundry steel, 2 ft & under	47.00 to 48.00
No. 1 RR. heavy melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Railroad grate bars	38.00 to 39.00
Steel axle turnings	29.00 to 30.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$46.00 to \$47.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	47.00 to 48.00

Buffalo

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	39.00 to 40.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	46.00 to 47.00
Scrap rails, random lgh.	47.00 to 48.00
Rails 3 ft and under	52.00 to 53.00
RR. steel wheels	48.00 to 49.00
RR. spring steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	38.50 to 39.50
No. 2 bundles	27.00 to 28.00
New busheling	38.50 to 39.50
Drop forge flashings	38.00 to 39.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'g. plate	38.50 to 39.50
No. 1 cupola cast	40.00 to 41.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast.	45.00 to 46.00

St. Louis

No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	38.50 to 39.50
No. 2 bundles	29.50 to 30.50
Machine shop turn.	25.00 to 26.00
Cast iron borings	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Locomotive tires uncut	49.00 to 50.00
Angles and splice bars	49.00 to 50.00
Std. steel car axles	49.00 to 50.00
RR. specialties	49.00 to 50.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	38.00 to 39.00
Cast iron car wheels	47.00 to 48.00
Malleable	47.00 to 48.00
Unstripped motor blocks	38.50 to 39.50

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	25.50 to 26.50
No. 1 busheling	35.00 to 36.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Machine shop turn.	17.50 to 18.50
Mixed bor. and short turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	21.00 to 22.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	35.00 to 36.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	32.00 to 33.00
Charging box cast.	37.00 to 38.00
Heavy breakable cast.	27.00 to 28.00
Unstripped motor blocks	24.00 to 25.00

Birmingham

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	37.00 to 38.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft.	41.00 to 42.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgh.	50.00 to 51.00
Rails, 18 in. and under	54.00 to 55.00
Angles & splice bars	60.00 to 61.00
Rerolling rails	63.00 to 64.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	28.00 to 29.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	23.00 to 24.00
Low phos., 18 in. & under	47.00 to 48.00
Rails, random lengths	49.00 to 50.00
Rails, 18 in. and under	57.00 to 58.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	35.00 to 36.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	32.00
No. 1 bundles	32.00
No. 2 bundles	29.00
No. 3 bundles	25.00
Machine shop turn.	12.00
Cast iron borings	11.00
No. 1 RR. hvy. melting	34.00
No. 1 cupola cast.	42.00

Los Angeles

No. 1 hvy. melting	\$33.00
No. 2 hvy. melting	31.00
No. 1 bundles	32.00
No. 2 bundles	28.00
No. 3 bundles	24.00
Machine shop turn.	12.00
Shoveling turnings	15.00
Cast iron borings	12.00
Elec. furn. 1 ft and under	32.00
No. 1 RR. hvy. melting	33.00
No. 1 cupola cast.	42.00

Seattle

No. 1 hvy. melting	\$35.50
No. 2 hvy. melting	31.50
No. 2 bundles	26.50
No. 3 bundles	21.50
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	\$38.50
No. 2 hvy. melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Bushelings	33.50
Bush., new fact. prep'd	36.50
Bush., new fact. unprep'd	32.50
Machine shop turn.	16.00
Short steel turn.	25.50
Mixed bor. and turn.	\$16.00 to 17.00
Rails, rerolling	47.50
Cast scrap	42.00 to 45.00



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CLEVELAND, OHIO
DETROIT, MICHIGAN
HOUSTON, TEXAS
LEAHIGH, PENNA.

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NEW YORK, N. Y.
PITTSBURGH, PENNA.
THELLO, CALIFORNIA
MONTREAL, CANADA

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IMPORT & EXPORT — LIVINGSTON & SOUTHWELL, INC., 22 Park Ave., New York, N. Y. & Canada Agencies FORESTRACO

September 22, 1955

149

Slight Relief For Aluminum

ODM turns loose 75,000 tons from stockpile . . . Halts aluminum fast tax write-offs . . . Harvey beats deadline to become nation's fifth producer.

◆ NEWS FROM and concerning the aluminum industry picked up considerably last week, although the undertones of the communiques were quite mixed. The overall outlook seems to indicate only slight immediate and future relief from the currently tight market.

The Office of Defense Mobilization declared that it would again consider fast tax write-offs for a small portion of the industries which had been frozen. Significant because of its absence from the list was aluminum. The ODM was quick to announce that this did not mean that tax amortization privileges were permanently withheld. But the indications are the door has been securely shut if not barred. An ODM spokesman explained the move by indicating that the industries ignored had either reached their intended production level or that expansion was not in the interests of national defense in accordance with the original idea of the law.

To balance the books, Arthur Flemming, head of ODM, announced that 75,000 tons of primary aluminum originally destined for the national stockpile would be diverted to industry to alleviate a serious shortage. This brings the total aluminum made available to industry by the Government to 250,000 tons.

Government thinking must obviously consider the current tight market in aluminum a temporary

condition. It recognizes the shortage with the diversion moves from stockpile to industry yet refuses to consider any more tax privileges to spur expansion.

In addition, Uncle Sam intends to repay Great Britain for the aluminum borrowed in 1952 and 1953 by diverting 11,000 more tons from the stockpile in the fourth quarter. Thus only 14,000 of the originally intended 100,000 tons will reach the stockpile.

In a move that now appears to have been fortunately timed, Harvey Machine Co., owners of 5 pct of Anaconda Aluminum, landed a certificate of necessity for fast tax write-off for the construction of a \$65 million primary aluminum plant at The Dalles, Ore.

Although Harvey intends to start construction immediately, the contract signed with the General Services Administration does not call for the delivery of aluminum until 1963. Intended capacity has been announced as 270,000 tons. Financing will come on the whole from private sources with such assistance as is necessary coming from the Government under the Defense Production Act with loan guarantees and advance payments.

More immediate aid is in the offing, according to an announcement from Kaiser Aluminum and Chemical Co. The company is seeking permission from the Securities and Exchange Commission

to sell 700,000 shares of \$50 par value cumulative preferred stock to help finance a \$90 million expansion program.

The firm intends to build additional sheet facilities costing \$75 million at a plant now under construction at Ravenswood, W. Va., spend \$2.75 million installing a cryolite recovery plant and direct chill billet facilities at its Chalmette, La., plant, and install additional reduction cells at the Mead and Tacoma plants which will cost \$2.25 million.

Funds for the expansion will come from the public sale of the stock, plus \$40 million from the sale to institutional investors of first mortgage bonds, and rescheduling bank loan payments which will make about \$13 million available.

COPPER . . . The Government is taking its time over the problem of providing substantial relief to defense contractors who need copper. The Office of Defense Mobilization admits no new effort to aid copper users following its initial decision to sell up to 5,759 tons to fabricators of vital military products. Only those firms which could show they might have to shut down for lack of metal were eligible to buy this copper from Defense Production Act inventory.

Word is received at the U. S. Commerce Dept. that there is copper available from sources asking up to 50 cents per lb. This would indicate a high degree of speculative activity and fabricators are understandably reluctant to become involved in these premium price deals.

In a recent estimate, a Commerce Dept. spokesman said that about 30 copper users have closed down or cut back operations because of a lack of the metal.

A partial potential alleviation of this critical supply situation may be assumed from the Copper Institute figures which show a tendency to return to normal of crude copper production following the strikes. August crude primary production in the U. S. rose to 67,635 tons.

An interesting sidelight to the copper crises is the fact that the rare metal selenium, a copper by-product, went up recently to \$13 per lb, and increase of \$3.59. But, as with copper, there is little available at the current market price. A thriving black market has seen as much as \$40 per lb being paid.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Sept. 14	Sept. 15	Sept. 16	Sept. 17	Sept. 19	Sept. 20
Copper, electro, Conn.	43.00	43.00	43.00	....	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	....	43.00	43.00
Tin, Straits, New York	97.25	97.25	96.50	96.375	96.77	97.00*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices

*Tentative

Nonferrous Prices (Effective Sept. 20, 1955)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 20,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet		Plate	
	0.032 in.	0.081 in.	0.136 in.	0.250 in.
1100 3003	40.8	38.7	37.5	36.5
3004	45.7	41.4	39.7	39.1
5052	48.3	43.4	41.7	39.9
2024-O, -OAL	51.2	42.5	41.0	41.2
7075-O, -OAL	62.6	50.8	48.5	48.6

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O 1/4 in., 61¢; 3/16 in., 62¢; 1/2 in., 64¢; 5/16 in., 65¢; 3/8 in., 66¢; 7/16 in., 68¢; 1/2 in., 69¢; 5/8 in., 71¢; 3/4 in., 72¢; 1 in., 74¢; 1 1/4 in., 76¢; 1 1/2 in., 78¢; 1 3/4 in., 80¢; 2 in., 82¢; 2 1/2 in., 84¢; 3 in., 86¢; 3 1/2 in., 88¢; 4 in., 90¢; 4 1/2 in., 92¢; 5 in., 94¢; 5 1/2 in., 96¢; 6 in., 98¢; 6 1/2 in., 100¢; 7 in., 102¢; 7 1/2 in., 104¢; 8 in., 106¢; 8 1/2 in., 108¢; 9 in., 110¢; 9 1/2 in., 112¢; 10 in., 114¢; 10 1/2 in., 116¢; 11 in., 118¢; 11 1/2 in., 120¢; 12 in., 122¢; 12 1/2 in., 124¢; 13 in., 126¢; 13 1/2 in., 128¢; 14 in., 130¢; 14 1/2 in., 132¢; 15 in., 134¢; 15 1/2 in., 136¢; 16 in., 138¢; 16 1/2 in., 140¢; 17 in., 142¢; 17 1/2 in., 144¢; 18 in., 146¢; 18 1/2 in., 148¢; 19 in., 150¢; 19 1/2 in., 152¢; 20 in., 154¢; 20 1/2 in., 156¢; 21 in., 158¢; 21 1/2 in., 160¢; 22 in., 162¢; 22 1/2 in., 164¢; 23 in., 166¢; 23 1/2 in., 168¢; 24 in., 170¢; 24 1/2 in., 172¢; 25 in., 174¢; 25 1/2 in., 176¢; 26 in., 178¢; 26 1/2 in., 180¢; 27 in., 182¢; 27 1/2 in., 184¢; 28 in., 186¢; 28 1/2 in., 188¢; 29 in., 190¢; 29 1/2 in., 192¢; 30 in., 194¢; 30 1/2 in., 196¢; 31 in., 198¢; 31 1/2 in., 200¢; 32 in., 202¢; 32 1/2 in., 204¢; 33 in., 206¢; 33 1/2 in., 208¢; 34 in., 210¢; 34 1/2 in., 212¢; 35 in., 214¢; 35 1/2 in., 216¢; 36 in., 218¢; 36 1/2 in., 220¢; 37 in., 222¢; 37 1/2 in., 224¢; 38 in., 226¢; 38 1/2 in., 228¢; 39 in., 230¢; 39 1/2 in., 232¢; 40 in., 234¢; 40 1/2 in., 236¢; 41 in., 238¢; 41 1/2 in., 240¢; 42 in., 242¢; 42 1/2 in., 244¢; 43 in., 246¢; 43 1/2 in., 248¢; 44 in., 250¢; 44 1/2 in., 252¢; 45 in., 254¢; 45 1/2 in., 256¢; 46 in., 258¢; 46 1/2 in., 260¢; 47 in., 262¢; 47 1/2 in., 264¢; 48 in., 266¢; 48 1/2 in., 268¢; 49 in., 270¢; 49 1/2 in., 272¢; 50 in., 274¢; 50 1/2 in., 276¢; 51 in., 278¢; 51 1/2 in., 280¢; 52 in., 282¢; 52 1/2 in., 284¢; 53 in., 286¢; 53 1/2 in., 288¢; 54 in., 290¢; 54 1/2 in., 292¢; 55 in., 294¢; 55 1/2 in., 296¢; 56 in., 298¢; 56 1/2 in., 300¢; 57 in., 302¢; 57 1/2 in., 304¢; 58 in., 306¢; 58 1/2 in., 308¢; 59 in., 310¢; 59 1/2 in., 312¢; 60 in., 314¢; 60 1/2 in., 316¢; 61 in., 318¢; 61 1/2 in., 320¢; 62 in., 322¢; 62 1/2 in., 324¢; 63 in., 326¢; 63 1/2 in., 328¢; 64 in., 330¢; 64 1/2 in., 332¢; 65 in., 334¢; 65 1/2 in., 336¢; 66 in., 338¢; 66 1/2 in., 340¢; 67 in., 342¢; 67 1/2 in., 344¢; 68 in., 346¢; 68 1/2 in., 348¢; 69 in., 350¢; 69 1/2 in., 352¢; 70 in., 354¢; 70 1/2 in., 356¢; 71 in., 358¢; 71 1/2 in., 360¢; 72 in., 362¢; 72 1/2 in., 364¢; 73 in., 366¢; 73 1/2 in., 368¢; 74 in., 370¢; 74 1/2 in., 372¢; 75 in., 374¢; 75 1/2 in., 376¢; 76 in., 378¢; 76 1/2 in., 380¢; 77 in., 382¢; 77 1/2 in., 384¢; 78 in., 386¢; 78 1/2 in., 388¢; 79 in., 390¢; 79 1/2 in., 392¢; 80 in., 394¢; 80 1/2 in., 396¢; 81 in., 398¢; 81 1/2 in., 400¢; 82 in., 402¢; 82 1/2 in., 404¢; 83 in., 406¢; 83 1/2 in., 408¢; 84 in., 410¢; 84 1/2 in., 412¢; 85 in., 414¢; 85 1/2 in., 416¢; 86 in., 418¢; 86 1/2 in., 420¢; 87 in., 422¢; 87 1/2 in., 424¢; 88 in., 426¢; 88 1/2 in., 428¢; 89 in., 430¢; 89 1/2 in., 432¢; 90 in., 434¢; 90 1/2 in., 436¢; 91 in., 438¢; 91 1/2 in., 440¢; 92 in., 442¢; 92 1/2 in., 444¢; 93 in., 446¢; 93 1/2 in., 448¢; 94 in., 450¢; 94 1/2 in., 452¢; 95 in., 454¢; 95 1/2 in., 456¢; 96 in., 458¢; 96 1/2 in., 460¢; 97 in., 462¢; 97 1/2 in., 464¢; 98 in., 466¢; 98 1/2 in., 468¢; 99 in., 470¢; 99 1/2 in., 472¢; 100 in., 474¢; 100 1/2 in., 476¢; 101 in., 478¢; 101 1/2 in., 480¢; 102 in., 482¢; 102 1/2 in., 484¢; 103 in., 486¢; 103 1/2 in., 488¢; 104 in., 490¢; 104 1/2 in., 492¢; 105 in., 494¢; 105 1/2 in., 496¢; 106 in., 498¢; 106 1/2 in., 500¢; 107 in., 502¢; 107 1/2 in., 504¢; 108 in., 506¢; 108 1/2 in., 508¢; 109 in., 510¢; 109 1/2 in., 512¢; 110 in., 514¢; 110 1/2 in., 516¢; 111 in., 518¢; 111 1/2 in., 520¢; 112 in., 522¢; 112 1/2 in., 524¢; 113 in., 526¢; 113 1/2 in., 528¢; 114 in., 530¢; 114 1/2 in., 532¢; 115 in., 534¢; 115 1/2 in., 536¢; 116 in., 538¢; 116 1/2 in., 540¢; 117 in., 542¢; 117 1/2 in., 544¢; 118 in., 546¢; 118 1/2 in., 548¢; 119 in., 550¢; 119 1/2 in., 552¢; 120 in., 554¢; 120 1/2 in., 556¢; 121 in., 558¢; 121 1/2 in., 560¢; 122 in., 562¢; 122 1/2 in., 564¢; 123 in., 566¢; 123 1/2 in., 568¢; 124 in., 570¢; 124 1/2 in., 572¢; 125 in., 574¢; 125 1/2 in., 576¢; 126 in., 578¢; 126 1/2 in., 580¢; 127 in., 582¢; 127 1/2 in., 584¢; 128 in., 586¢; 128 1/2 in., 588¢; 129 in., 590¢; 129 1/2 in., 592¢; 130 in., 594¢; 130 1/2 in., 596¢; 131 in., 598¢; 131 1/2 in., 600¢; 132 in., 602¢; 132 1/2 in., 604¢; 133 in., 606¢; 133 1/2 in., 608¢; 134 in., 610¢; 134 1/2 in., 612¢; 135 in., 614¢; 135 1/2 in., 616¢; 136 in., 618¢; 136 1/2 in., 620¢; 137 in., 622¢; 137 1/2 in., 624¢; 138 in., 626¢; 138 1/2 in., 628¢; 139 in., 630¢; 139 1/2 in., 632¢; 140 in., 634¢; 140 1/2 in., 636¢; 141 in., 638¢; 141 1/2 in., 640¢; 142 in., 642¢; 142 1/2 in., 644¢; 143 in., 646¢; 143 1/2 in., 648¢; 144 in., 650¢; 144 1/2 in., 652¢; 145 in., 654¢; 145 1/2 in., 656¢; 146 in., 658¢; 146 1/2 in., 660¢; 147 in., 662¢; 147 1/2 in., 664¢; 148 in., 666¢; 148 1/2 in., 668¢; 149 in., 670¢; 149 1/2 in., 672¢; 150 in., 674¢; 150 1/2 in., 676¢; 151 in., 678¢; 151 1/2 in., 680¢; 152 in., 682¢; 152 1/2 in., 684¢; 153 in., 686¢; 153 1/2 in., 688¢; 154 in., 690¢; 154 1/2 in., 692¢; 155 in., 694¢; 155 1/2 in., 696¢; 156 in., 698¢; 156 1/2 in., 700¢; 157 in., 702¢; 157 1/2 in., 704¢; 158 in., 706¢; 158 1/2 in., 708¢; 159 in., 710¢; 159 1/2 in., 712¢; 160 in., 714¢; 160 1/2 in., 716¢; 161 in., 718¢; 161 1/2 in., 720¢; 162 in., 722¢; 162 1/2 in., 724¢; 163 in., 726¢; 163 1/2 in., 728¢; 164 in., 730¢; 164 1/2 in., 732¢; 165 in., 734¢; 165 1/2 in., 736¢; 166 in., 738¢; 166 1/2 in., 740¢; 167 in., 742¢; 167 1/2 in., 744¢; 168 in., 746¢; 168 1/2 in., 748¢; 169 in., 750¢; 169 1/2 in., 752¢; 170 in., 754¢; 170 1/2 in., 756¢; 171 in., 758¢; 171 1/2 in., 760¢; 172 in., 762¢; 172 1/2 in., 764¢; 173 in., 766¢; 173 1/2 in., 768¢; 174 in., 770¢; 174 1/2 in., 772¢; 175 in., 774¢; 175 1/2 in., 776¢; 176 in., 778¢; 176 1/2 in., 780¢; 177 in., 782¢; 177 1/2 in., 784¢; 178 in., 786¢; 178 1/2 in., 788¢; 179 in., 790¢; 179 1/2 in., 792¢; 180 in., 794¢; 180 1/2 in., 796¢; 181 in., 798¢; 181 1/2 in., 800¢; 182 in., 802¢; 182 1/2 in., 804¢; 183 in., 806¢; 183 1/2 in., 808¢; 184 in., 810¢; 184 1/2 in., 812¢; 185 in., 814¢; 185 1/2 in., 816¢; 186 in., 818¢; 186 1/2 in., 820¢; 187 in., 822¢; 187 1/2 in., 824¢; 188 in., 826¢; 188 1/2 in., 828¢; 189 in., 830¢; 189 1/2 in., 832¢; 190 in., 834¢; 190 1/2 in., 836¢; 191 in., 838¢; 191 1/2 in., 840¢; 192 in., 842¢; 192 1/2 in., 844¢; 193 in., 846¢; 193 1/2 in., 848¢; 194 in., 850¢; 194 1/2 in., 852¢; 195 in., 854¢; 195 1/2 in., 856¢; 196 in., 858¢; 196 1/2 in., 860¢; 197 in., 862¢; 197 1/2 in., 864¢; 198 in., 866¢; 198 1/2 in., 868¢; 199 in., 870¢; 199 1/2 in., 872¢; 200 in., 874¢; 200 1/2 in., 876¢; 201 in., 878¢; 201 1/2 in., 880¢; 202 in., 882¢; 202 1/2 in., 884¢; 203 in., 886¢; 203 1/2 in., 888¢; 204 in., 890¢; 204 1/2 in., 892¢; 205 in., 894¢; 205 1/2 in., 896¢; 206 in., 898¢; 206 1/2 in., 900¢; 207 in., 902¢; 207 1/2 in., 904¢; 208 in., 906¢; 208 1/2 in., 908¢; 209 in., 910¢; 209 1/2 in., 912¢; 210 in., 914¢; 210 1/2 in., 916¢; 211 in., 918¢; 211 1/2 in., 920¢; 212 in., 922¢; 212 1/2 in., 924¢; 213 in., 926¢; 213 1/2 in., 928¢; 214 in., 930¢; 214 1/2 in., 932¢; 215 in., 934¢; 215 1/2 in., 936¢; 216 in., 938¢; 216 1/2 in., 940¢; 217 in., 942¢; 217 1/2 in., 944¢; 218 in., 946¢; 218 1/2 in., 948¢; 219 in., 950¢; 219 1/2 in., 952¢; 220 in., 954¢; 220 1/2 in., 956¢; 221 in., 958¢; 221 1/2 in., 960¢; 222 in., 962¢; 222 1/2 in., 964¢; 223 in., 966¢; 223 1/2 in., 968¢; 224 in., 970¢; 224 1/2 in., 972¢; 225 in., 974¢; 225 1/2 in., 976¢; 226 in., 978¢; 226 1/2 in., 980¢; 227 in., 982¢; 227 1/2 in., 984¢; 228 in., 986¢; 228 1/2 in., 988¢; 229 in., 990¢; 229 1/2 in., 992¢; 230 in., 994¢; 230 1/2 in., 996¢; 231 in., 998¢; 231 1/2 in., 1000¢; 232 in., 1002¢; 232 1/2 in., 1004¢; 233 in., 1006¢; 233 1/2 in., 1008¢; 234 in., 1010¢; 234 1/2 in., 1012¢; 235 in., 1014¢; 235 1/2 in., 1016¢; 236 in., 1018¢; 236 1/2 in., 1020¢; 237 in., 1022¢; 237 1/2 in., 1024¢; 238 in., 1026¢; 238 1/2 in., 1028¢; 239 in., 1030¢; 239 1/2 in., 1032¢; 240 in., 1034¢; 240 1/2 in., 1036¢; 241 in., 1038¢; 241 1/2 in., 1040¢; 242 in., 1042¢; 242 1/2 in., 1044¢; 243 in., 1046¢; 243 1/2 in., 1048¢; 244 in., 1050¢; 244 1/2 in., 1052¢; 245 in., 1054¢; 245 1/2 in., 1056¢; 246 in., 1058¢; 246 1/2 in., 1060¢; 247 in., 1062¢; 247 1/2 in., 1064¢; 248 in., 1066¢; 248 1/2 in., 1068¢; 249 in., 1070¢; 249 1/2 in., 1072¢; 250 in., 1074¢; 250 1/2 in., 1076¢; 251 in., 1078¢; 251 1/2 in., 1080¢; 252 in., 1082¢; 252 1/2 in., 1084¢; 253 in., 1086¢; 253 1/2 in., 1088¢; 254 in., 1090¢; 254 1/2 in., 1092¢; 255 in., 1094¢; 255 1/2 in., 1096¢; 256 in., 1098¢; 256 1/2 in., 1100¢; 257 in., 1102¢; 257 1/2 in., 1104¢; 258 in., 1106¢; 258 1/2 in., 1108¢; 259 in., 1110¢; 259 1/2 in., 1112¢; 260 in., 1114¢; 260 1/2 in., 1116¢; 261 in., 1118¢; 261 1/2 in., 1120¢; 262 in., 1122¢; 262 1/2 in., 1124¢; 263 in., 1126¢; 263 1/2 in., 1128¢; 264 in., 1130¢; 264 1/2 in., 1132¢; 265 in., 1134¢; 265 1/2 in., 1136¢; 266 in., 1138¢; 266 1/2 in., 1140¢; 267 in., 1142¢; 267 1/2 in., 1144¢; 268 in., 1146¢; 268 1/2 in., 1148¢; 269 in., 1150¢; 269 1/2 in., 1152¢; 270 in., 1154¢; 270 1/2 in., 1156¢; 271 in., 1158¢; 271 1/2 in., 1160¢; 272 in., 1162¢; 272 1/2 in., 1164¢; 273 in., 1166¢; 273 1/2 in., 1168¢; 274 in., 1170¢; 274 1/2 in., 1172¢; 275 in., 1174¢; 275 1/2 in., 1176¢; 276 in., 1178¢; 276 1/2 in., 1180¢; 277 in., 1182¢; 277 1/2 in., 1184¢; 278 in., 1186¢; 278 1/2 in., 1188¢; 279 in., 1190¢; 279 1/2 in., 1192¢; 280 in., 1194¢; 280 1/2 in., 1196¢; 281 in., 1198¢; 281 1/2 in., 1200¢; 282 in., 1202¢; 282 1/2 in., 1204¢; 283 in., 1206¢; 283 1/2 in., 1208¢; 284 in., 1210¢; 284 1/2 in., 1212¢; 285 in., 1214¢; 285 1/2 in., 1216¢; 286 in., 1218¢; 286 1/2 in., 1220¢; 287 in., 1222¢; 287 1/2 in., 1224¢; 288 in., 1226¢; 288 1/2 in., 1228¢; 289 in., 1230¢; 289 1/2 in., 1232¢; 290 in., 1234¢; 290 1/2 in., 1236¢; 291 in., 1238¢; 291 1/2 in., 1240¢; 292 in., 1242¢; 292 1/2 in., 1244¢; 293 in., 1246¢; 293 1/2 in., 1248¢; 294 in., 1250¢; 294 1/2 in., 1252¢; 295 in., 1254¢; 295 1/2 in., 1256¢; 296 in., 1258¢; 296 1/2 in., 1260¢; 297 in., 1262¢; 297 1/2 in., 1264¢; 298 in., 1266¢; 298 1/2 in., 1268¢; 299 in., 1270¢; 299 1/2 in., 1272¢; 300 in., 1274¢; 300 1/2 in., 1276¢; 301 in., 1278¢; 301 1/2 in., 1280¢; 302 in., 1282¢; 302 1/2 in., 1284¢; 303 in., 1286¢; 303 1/2 in., 1288¢; 304 in., 1290¢; 304 1/2 in., 1292¢; 305 in., 1294¢; 305 1/2 in., 1296¢; 306 in., 1298¢; 306 1/2 in., 1300¢; 307 in., 1302¢; 307 1/2 in., 1304¢; 308 in., 1306¢; 308 1/2 in., 1308¢; 309 in., 1310¢; 309 1/2 in., 1312¢; 310 in., 1314¢; 310 1/2 in., 1316¢; 311 in., 1318¢; 311 1/2 in., 1320¢; 312 in., 1322¢; 312 1/2 in., 1324¢; 313 in., 1326¢; 313 1/2 in., 1328¢; 314 in., 1330¢; 314 1/2 in., 1332¢; 315 in., 1334¢; 315 1/2 in., 1336¢; 316 in., 1338¢; 316 1/2 in., 1340¢; 317 in., 1342¢; 317 1/2 in., 1344¢; 318 in., 1346¢; 318 1/2 in., 1348¢; 319 in., 1350¢; 319 1/2 in., 1352¢; 320 in., 1354¢; 320 1/2 in., 1356¢; 321 in., 1358¢; 321 1/2 in., 1360¢; 322 in., 1362¢; 322 1/2 in., 1364¢; 323 in., 1366¢; 323 1/2 in., 1368¢; 324 in., 1370¢; 324 1/2 in., 1372¢; 325 in., 1374¢; 325 1/2 in., 1376¢; 326 in., 1378¢; 326 1/2 in., 1380¢; 327 in., 1382¢; 327 1/2 in., 1384¢; 328 in., 1386¢; 328 1/2 in., 1388¢; 329 in., 1390¢; 329 1/2 in., 1392¢; 330 in., 1394¢; 330 1/2 in., 1396¢; 331 in., 1398¢; 331 1/2 in., 1400¢; 332 in., 1402¢; 332 1/2 in., 1404¢; 333 in., 1406¢; 333 1/2 in., 1408¢; 334 in., 1410¢; 334 1/2 in., 1412¢; 335 in., 1414¢; 335 1/2 in., 1416¢; 336 in., 1418¢; 336 1/2 in., 1420¢; 337 in., 1422¢; 337 1/2 in., 1424¢; 338 in., 1426¢; 338 1/2 in., 1428¢; 339 in., 1430¢; 339 1/2 in., 1432¢; 340 in., 1434¢; 340 1/2 in., 1436¢; 341 in., 1438¢; 341 1/2 in., 1440¢; 342 in., 1442¢; 342 1/2 in., 1444¢; 343 in., 1446¢; 343 1/2 in., 1448¢; 344 in., 1450¢; 344 1/2 in., 1452¢; 345 in., 1454¢; 345 1/2 in., 1456¢; 346 in., 1458¢; 346 1/2 in., 1460¢; 347 in., 1462¢; 347 1/2 in., 1464¢; 348 in., 1466¢; 348 1/2 in., 1468¢; 349 in., 1470¢; 349 1/2 in., 1472¢; 350 in., 1474¢; 350 1/2 in., 1476¢; 351 in., 1478¢; 351 1/2 in., 1480¢; 352 in., 1482¢; 352 1/2 in., 1484¢; 353 in., 1486¢; 353 1/2 in., 1488¢; 354 in., 1490¢; 354 1/2 in., 1492¢; 355 in., 1494¢; 355 1/2 in., 1496¢; 356 in., 1498¢; 356 1/2 in., 1500¢; 357 in., 1502¢; 357 1/2 in., 1504¢; 358 in., 1506¢; 358 1/2 in., 1508¢; 359 in., 1510¢; 359 1/2 in., 1512¢; 360 in., 1514¢; 360 1/2 in., 1516¢; 361 in., 1518¢; 361 1/2 in., 1520¢; 362 in., 1522¢; 362 1/2 in., 1524¢; 363 in., 1526¢; 363 1/2 in., 1528¢; 364 in., 1530¢; 364 1/2 in., 1532¢; 365 in., 1534¢; 365 1/2 in., 1536¢; 366 in., 1538¢; 366 1/2 in., 1540¢; 367 in., 1542¢; 367 1/2 in., 1544¢; 368 in., 1546¢; 368 1/2 in., 1548¢; 369 in., 1550¢; 369 1/2 in., 1552¢; 370 in., 1554¢; 370 1/2 in., 1556¢; 371 in., 1558¢; 371 1/2 in., 1560¢; 372 in., 1562¢; 372 1/2 in., 1564¢; 373 in., 1566¢; 373 1/2 in., 1568¢; 374 in., 1570¢; 374 1/2 in., 1572¢; 375 in., 1574¢; 375 1/2 in., 1576¢; 376 in., 1578¢; 376 1/2 in., 1580¢; 377 in., 1582¢; 377 1/2 in., 1584¢; 378 in., 1586¢; 378 1/2 in., 1588¢; 379 in., 1590¢; 379 1/2 in., 1592¢; 380 in., 1594¢; 380 1/2 in., 1596¢; 381 in., 1598¢; 381 1/2 in., 1600¢; 382 in., 1602¢; 382 1/2 in., 1604¢; 383 in., 1606¢; 383 1/2 in., 1608¢; 384 in., 1610¢; 384 1/2 in., 1612¢; 385 in., 1614¢; 385 1/2 in., 1616¢; 386 in., 1618¢; 386 1/2 in., 1620¢; 387 in., 1622¢; 387 1/2 in., 1624¢; 388 in., 1626¢; 388 1/2 in., 1628¢; 389 in., 1630¢; 389 1/2 in., 1632¢; 390 in., 1634¢; 390 1/2 in., 1636¢; 391 in., 1638¢; 391 1/2 in., 1640¢; 392 in., 1642¢; 392 1/2 in., 1644¢; 393 in., 1646¢; 393 1/2 in., 1648¢; 394 in., 1650¢; 394 1/2 in., 1652¢; 395 in., 1654¢; 395 1/2 in., 1656¢; 396 in., 1658¢; 396 1/2 in., 1660¢; 397 in., 1662¢; 397 1/2 in., 1664¢; 398 in., 1666¢; 398 1/2 in., 1668¢; 399 in., 1670¢; 399 1/2 in., 1672¢; 400 in., 1674¢; 400 1/2 in., 1676¢; 401 in., 1678¢; 401 1/2 in., 1680¢; 402 in., 1682¢; 402 1/2 in., 1684¢; 403 in., 1686¢; 403 1/2 in., 1688¢; 404 in., 1690¢; 404 1/2 in., 1692¢; 405 in., 1694¢; 405 1

STEEL PRICES

(Effective Sept. 20, 1955)

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Buffalo, N. Y.	\$68.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B3	4.65 B3	4.325 R3, B3	6.25 B3 6.25 R7, S10	6.425 B3	9.125 B3		
	Claymont, Del.													
	Harrison, N. J.													13.45 C11
	Conschohocken, Pa.								4.375 A2	6.30 A2	6.425 A2			
	New Bedford, Mass.									6.70 R6				
	Johnstown, Pa.	\$68.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3							
	Boston, Mass.									6.80 T8				13.80 T8
	New Haven, Conn.									6.70 D1 7.00 A5				
	Phoenixville, Pa.					5.15 P2		5.15 P2						
	Sparrows Pt., Md.								4.325 B3	6.25 B3	6.425 B3	9.125 B3		
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8						4.625 N8	6.70 W1			7.50 N8	
MIDDLE WEST	Pawtucket, R. I. Worcester, Mass.									6.80 N7 7.10 A5				A5 13.80 N7
	Alton, Ill.								4.50 L1					
	Ashland, Ky.								4.325 A7					
	Canton-Massillon, Dover, Ohio		\$86.50 R3	\$96.00 R3										13.45 G6
	Chicago, Ill.	\$68.50 U1	\$84.50 R3, U1, W8	\$96.00 R3, U1, W8	5.45 U1	4.60 U1, W8	6.75 U1, Y1	4.60 U1	4.325 A1, N4, W8	6.35 A1, T8			7.20 W8	13.45 T8
	Cleveland, Ohio									6.25 A5, J3		9.30 A5		13.45 A5
	Detroit, Mich.			\$96.00 R5					4.425 G3, M2	6.35 D1, D2, G3, M2, P11	6.525 G3	9.20 D2, G3		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$68.50 U1	\$84.50 U1	\$96.00 U1, Y1	5.45 J3	4.60 U1, J3	6.75 U1, J3		4.325 J3, U1, Y1	6.35 J3 6.25 Y1	6.425 J3, U1, Y1	9.30 Y1	7.20 Y1, U1	
	Sterling, Ill.								4.425 N4					
	Indianapolis, Ind.									6.40 C5				
	Newport, Ky.												7.20 N5	
	Middletown, Ohio									6.45 A7				
	Niles, Warren, Ohio Sharon, Pa.	\$68.50 C10	\$84.50 C10	\$96.00 C10					4.325 S1, R3	6.25 S1, R3, T4	6.425 S1, R3	9.10 S1, R3	7.20 S1	13.45 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 U1, J3	\$84.50 J3, U1, C11	\$96.00 U1, C11	5.45 U1	4.60 U1, J3	6.75 U1, J3	4.60 U1	4.325 P6	6.25 S7, B4			7.20 S9	13.45 S9
	Portsmouth, Ohio								4.325 P7	6.25 P7				
	Weirton, Wheeling, Follansbee, W. Va.					4.60 W3			4.325 W3	6.25 F3, W3	6.425 W3	9.10 W3		
	Youngstown, Ohio		\$84.50 C10	\$96.00 Y1, C10		4.60 Y1	6.75 Y1		4.325 U1, Y1	6.25 Y1, C5	6.425 U1, Y1	9.30 Y1	7.20 U1, Y1	13.45 C5
WEST	Fenoma, Cal.	\$76.00 K1	\$92.00 K1	\$115.00 K1		5.25 K1	7.40 K1	5.40 K1	5.975 K1	8.00 K1	7.525 K1		8.85 K1	
	Geneva, Utah		\$84.50 C7			4.60 C7	6.75 C7							
	Kansas City, Mo.					4.70 S2	6.85 S2				6.675 S2		7.45 S2	
	Los Angeles, Yorba Linda, Cal.		\$94.00 B2	\$116.00 B2		5.30 C7, B2	7.45 B2		5.975 C7, B2	8.30 C1			8.40 B2	
	Minneapolis, Colo.					4.80 C6			5.425 C6					
	Portland, Ore.					5.35 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$94.00 B2			5.25 B2, P9	7.00 B2		5.975 B2, C7					
	Seattle, Wash.		\$95.00 B2			5.35 B2	7.50 B2		5.325 B2					
	Atlanta, Ga.								4.525 A8					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$68.50 T2	\$84.50 T2			4.60 C16, R3, T2	6.75 T2		4.325 R3, C16, T2		6.425 T2			
	Houston, Lone Star, Tex.	\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2				6.675 S2		7.45 S2	

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES (Effective Sept. 20, 1955)		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & livyr.	Cold-rolled	Galvanized 10 ga.	Enamel- ing 12 ga.	Long Ternc 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 7.25-lb. base box	Electro* 8.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			W6	† Special coated mfg. terms deduct 95¢ from 1.25-lb. cokes base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25-lb. cokes base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.10. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conschoecken, Pa.	4.375 A2	5.375 A2				6.425 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.									5.825 B3				
	Fairless, Pa.	4.375 U1	5.375 U1				6.425 U1	7.925 U1				\$8.90 U1	\$7.60 U1	
	New Haven, Conn.													
Phoenixville, Pa.														
Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.60 B3		5.125 B3	\$8.90 B3	\$7.60 B3		
Worcester, Mass.										5.325 A5				
Trenton, N. J.														
MIDDLE WEST	Alton, Ill.									5.20 L1				
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 A7									
	Canton-Massillon, Dover, Ohio			5.85 R1, R3										
	Chicago, Joliet, Ill.	4.325 A1, W8					6.375 U1			5.825 A5, N4 R3				
	Sterling, Ill.									5.125 N4				
	Cleveland, Ohio	4.325 J3, R3	5.325 J3, R3		5.90 R3		6.375 J3, R3	7.875 J3, R3			5.825 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 G3, 5.325 M2				6.475 G3	7.975 G3						
	Newport, Ky.	4.325 N5	5.325 N5	5.85 N5										
	Gary, Ind. Harbor, Indiana	4.325 J3, U1, Y1	5.325 J3, U1, Y1	5.85 U1, J3	5.90 U1, J3	6.25 U1	6.375 Y1, U1, J3	7.875 U1, Y1			5.825 Y1	\$8.90 J3, U1, Y1	\$7.50 J3, U1, Y1	6.65 U1, Y1
	Granite City, Ill.	4.525 G2	5.525 G2	6.05 G2	6.10 G2								\$7.60 G2	6.75 G2
	Kokomo, Ind.	4.425 C9		5.95 C9						5.475 C9	5.125 C9			
	Mansfield, Ohio	4.325 E2	5.325 E2			6.25 E2				E2				
	Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7								
	Niles, Warren, Ohio Sharon, Pa.	4.325 S1, R3, N3	5.325 R3, N3	5.85 R3, 6.85 N3	5.90 N3	6.25 N3	6.375 S1, R3	7.875 R3				\$8.80 R3	\$7.50 R3	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 J3, U1, P6	5.325 J3, U1, P6	5.85 U1	5.90 U1, A7		6.375 J3, U1	7.875 U1	8.60 U1		5.825 A5, P6	\$8.90 J3, U1	\$7.50 J3, U1	6.65 U1
Portsmouth, Ohio	4.325 P7	5.325 P7								5.825 P7				
Weirton, Wheeling, Follansbee, W. Va.	4.325 W3, W3	5.325 W3, W5, F3	5.85 W3, W5		6.25 W3, W5	6.375 W3	7.875 W3				\$8.80 W3, W5	\$7.50 W3, W5	6.65 F3, W5	
Youngstown, Ohio	4.325 U1, Y1	5.325 Y1		5.90 Y1		6.375 U1, Y1	7.875 Y1			5.825 Y1				
WEST	Fontana, Cal.	5.875 K1	6.425 K1				7.125 K1	8.975 K1						
	Geneva, Utah	4.425 C7												
	Kansas City, Mo.									5.275 S2				
	Los Angeles, Torrance, Cal.									5.825 H2				
	Minneapolis, Colo.									5.275 C6				
	San Francisco, Niles, Pittsburg, Cal.	5.825 C7	6.275 C7	6.60 C7						5.675 C7	\$9.55 C7	\$8.25 C7		
	Seattle, Wash.													
	Atlanta, Ga.													
SOUTH	Fairfield, Ala. Alabama City, Ala.	4.325 R3, T2	5.325 T2	5.85 R3, T2			6.375 T2			5.625 R3	5.825 R3, T2	\$8.90 T2	\$7.60 T2	
	Houston, Tex.									5.275 S2				

IRON AGE

STEEL
PRICES(Effective
Sept. 30, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	
EAST	Bethlehem, Pa.				5.575 B3	7.425 B3	6.80 B3					
	Buffalo, N. Y.	4.65 B3,R3	4.65 B3,R3	5.95 B5	5.575 B3,R3	7.425 B3,B5	6.80 B3	4.50 B3,R3				6.25 W6
	Claymont, Del.							4.50 C4		6.30 C4		
	Cokesville, Pa.							4.50 L4		6.30 L4	6.725 L4	
	Consolidated, Pa.							4.50 A2	5.575 A2		6.725 A2	
	Harrisburg, Pa.							5.10 C3	5.575 C3			
	Hartford, Conn.			6.40 R3		7.725 R3						
	Johstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.50 B3		6.30 B3	6.725 B3	6.25 B3
	Fairless, Pa.	4.80 U1	4.80 U1		5.725 U1							
	Newark, N. J.			6.35 W10		7.60 W10						
	Camden, N. J.			6.35 P10								
MIDDLE WEST	Bridgeport, Putnam, Conn.	4.80 N8		6.45 W10	5.725 N8			4.750 N8				
	Sparrows Pt., Md.		4.65 B3					4.50 B3		6.30 B3	6.725 B3	6.35 B3
	Palmer, Worcester, Roadville, Mansfield, Mass.			6.35 W11 6.45 B5,C14		7.725 A5,B5		4.50 R3				6.55 A5, W6
	Alton, Ill.	4.85 L1										6.425 L1
	Ashland, Newport, Ky.							4.50 A7,N5		6.30 N5		
	Canton-Massillon, Mansfield, Ohio	4.75 R3		5.90 R2,R3	5.575 R3,T5	7.425 R2,R3, T5		4.50 E2				
	Chicago, Joliet, Ill.	4.65 U1, N4,W8,R3, P15	4.65 N4,R3, P15	5.90 A5,W10, W8,B5,L2	5.575 U1,R3, W8	7.425 A5,W8, W10,L2,B5		4.50 U1,W8, J3,A1,R3	5.575 U1	6.30 U1	6.725 U1	6.25 A5,R3, N4,W7
	Cleveland, Ohio	4.65 R3	4.65 R3	5.90 A5,C13		7.425 A5,C13	6.80 R3	4.60 J3,R3	5.575 J3		6.725 R3,J3	6.25 A5, C13
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.10 B5,P8 6.15 P3	5.575 R5 5.475 G3	7.425 R5 7.625 B5,P3 P8	6.90 G3	4.60 G3			6.825 G3	
	Duluth, Minn.											6.25 A5
	Gary, Ind. Harbor, Crawfordsville	4.65 J3,U1, Y1	4.65 J3,U1, Y1	5.90 M5,R3	5.575 J3,U1, Y1	7.425 M5, R3	6.80 U1,J3, Y1	4.50 J3, U1,Y1	5.575 J3	6.30 U1,Y1	6.725 U1,J3, Y1	6.35 M4
WEST	Granite City, Ill.							4.70 G2				6.35 C9
	Kokomo, Ind.											6.35 N4
	Sterling, Ill.	4.75 N4	4.75 N4									
	Niles, Warren, Ohio Sharon, Pa.	4.65 R3,C10		5.90 C10	5.575 C10	7.425 C10	6.80 R3	4.50 S1,R3		6.30 S1	6.725 S1	
	Pittsburgh, Pa. Midland, Pa.	4.65 J3,U1, C11	4.65 J3,U1	5.90 A5,C8, C11,J3, W10,B4,R3	5.575 U1,C11	7.425 A5,C11, W10,C8,R3	6.80 J3,U1	4.50 J3,U1	5.575 U1	6.30 U1	6.725 J3,U1	6.25 A5,J3, P6
	Portsmouth, Ohio											6.25 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.65 W3						4.50 W3,W3				
	Youngstown, Ohio	4.65 U1,Y1, C10,R3	4.65 U1,Y1, R3	5.90 Y1,U1	5.575 U1,Y1, C10	7.425 Y1,C10 7.645 P2	6.80 U1,Y1	4.50 U1,Y1, R3		6.30 Y1	6.725 Y1	6.25 Y1
	Emeryville, Cal.	5.40 J5	5.40 J5									
	Fontana, Cal.	5.35 K1	5.35 K1		6.425 K1		7.50 K1	5.15 K1		6.95 K1	7.375 K1	
	Geneva, Utah							4.50 C7			6.725 C7	
SOUTHWEST	Kansas City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.05 S2					6.50 S2
	Los Angeles, Torrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.35 R3	6.425 B2		7.50 B2				7.625 B2	7.20 B2
	Minneapolis, Colo.	5.10 C6	5.10 C6					5.35 C6				6.50 C6
	Portland, Ore.	5.40 O2	5.40 O2									
	San Francisco, Niles, Pittsburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2					7.20 C7
	Seattle, Wash.	5.40 B2,P12, N6	5.40 B2,P12				7.55 B2	5.40 B2		7.20 B2	7.625 B2	
	Atlanta, Ga.	4.85 A8	4.85 A8									6.45 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,C16, R3	4.65 T2,C16, R3				6.80 T2	4.50 T2,R3			6.725 T2	6.25 R3, T2
	Houston, Ft. Worth, Lone Star, Tex.	4.90 S2	4.90 S2		5.825 S2		7.05 S2	4.85 L3 4.60 S2		6.40 S2	6.825 S2	6.50 S2

Key to Steel Producers

With Principal Offices

41 Arco Steel Co., Chicago
 42 Alan Wood Steel Co., Conahocken, Pa.
 43 Allegheny Ludlum Steel Corp., Pittsburgh
 44 American Cladmetals Co., Carnegie, Pa.
 45 American Steel & Wire Div., Cleveland
 46 Angell Nail & Chaplet Co., Cleveland
 47 Armco Steel Corp., Middletown, O.
 48 Atlantic Steel Co., Atlanta, Ga.
 81 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
 82 Bethlehem Pacific Coast Steel Corp., San Francisco
 83 Bethlehem Steel Co., Bethlehem, Pa.
 84 Blair Strip Steel Co., New Castle, Pa.
 85 Bliss & Laughlin, Inc., Harvey, Ill.
 86 Brock Plant, Wickwire Spencer Steel Div., Hardsboro, Pa.
 C1 Calstrip Steel Corp., Los Angeles
 C2 Carpenter Steel Co., Reading, Pa.
 C3 Central Iron & Steel Co., Harrisburg, Pa.
 C4 Claymont Products Dept., Claymont, Del.
 C5 Cold Metal Products Co., Youngstown, O.
 C6 Colorado Fuel & Iron Corp., Denver
 C7 Columbia Geneva Steel Div., San Francisco
 C8 Columbia Steel & Shifting Co., Pittsburgh
 C9 Continental Steel Corp., Kokomo, Ind.
 C10 Coppersweld Steel Co., Pittsburgh, Pa.
 C11 Crucible Steel Co. of America, Pittsburgh
 C12 Cumberland Steel Co., Cumberland, Md.
 C13 Cuyahoga Steel & Wire Co., Cleveland
 C14 Compressed Steel Shifting Co., Readville, Mass.
 C15 G. O. Carlson, Inc., Thorndale, Pa.
 C16 Consors Steel Div., Birmingham
 C17 Chester Blast Furnace Inc., Chester, Pa.
 D1 Detroit Steel Corp., Detroit
 D2 Detroit Tube & Steel Div., Detroit
 D3 Driver Harris Co., Harrison, N. J.
 D4 Dickson Weatherproof Nail Co., Evanston, Ill.
 D5 Henry Dutton & Sons, Inc., Philadelphia
 E1 Eastern Stainless Steel Corp., Baltimore
 E2 Empire Steel Co., Mansfield, O.
 F1 Fifth Sterling, Inc., McKeesport, Pa.
 F2 Fitzsimmons Steel Corp., Youngstown
 F3 Fallanabee Steel Corp., Fallanabee, W. Va.
 Globe Iron Co., Jackson, O.

G3 Granite City Steel Co., Granite City, Ill.
 G4 Great Lakes Steel Corp., Detroit
 G5 Greer Steel Co., Dover, O.
 H1 Hanna Furnace Corp., Detroit
 I2 Ingersoll Steel Div., Chicago
 I3 Inland Steel Co., Chicago
 I4 Interlake Iron Corp., Cleveland
 J1 Jackson Iron & Steel Co., Jackson, O.
 J2 Jessup Steel Corp., Washington, Pa.
 J3 Jones & Laughlin Steel Corp., Pittsburgh
 J4 Judyn Mfg. & Supply Co., Chicago
 J5 Judson Steel Corp., Emeryville, Calif.
 K1 Kaiser Steel Corp., Fontana, Cal.
 K2 Keystone Steel & Wire Co., Peoria
 K3 Koppers Co., Granite City, Ill.
 L1 Laclede Steel Co., St. Louis
 L2 La Salle Steel Co., Chicago
 L3 Lone Star Steel Co., Dallas
 L4 Lukens Steel Co., Coatesville, Pa.
 M1 Mahoning Valley Steel Co., Niles, O.
 M2 McLouth Steel Corp., Detroit
 M3 Mercer Tube & Mfg. Co., Sharon, Pa.
 M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
 M5 Monarch Steel Div., Hammond, Ind.
 M6 Mystic Iron Works, Everett, Mass.
 N1 National Supply Co., Pittsburgh
 N2 National Tube Div., Pittsburgh
 N3 Niles Rolling Mill Div., Niles, O.
 N4 Northwestern Steel & Wire Co., Sterling, Ill.
 N5 Newport Steel Corp., Newport, Ky.
 N6 Northwest Steel Rolling Mills, Seattle
 N7 Newman Crosby Steel Co., Pawtucket, R. I.
 N8 Northeastern Steel Corp., Bridgeport, Conn.
 O1 Oliver Iron & Steel Co., Pittsburgh
 O2 Oregon Steel Mills, Portland
 P1 Page Steel & Wire Div., Monroeville, Pa.
 P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
 P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
 P4 Pittsburgh Coke & Chemical Co., Pittsburgh
 P5 Pittsburgh Screw & Bolt Co., Pittsburgh
 P6 Pittsburgh Steel Co., Pittsburgh
 P7 Portsmouth Div., Detroit Steel Corp., Detroit
 P8 Plymouth Steel Co., Detroit

P9 Pacific States Steel Co., Niles, Cal.
 P10 Precision Drawn Steel Co., Camden, N.
 P11 Production Steel Strip Corp., Detroit
 P12 Pacific Steel Rolling Mills, Seattle
 P13 Phoenix Mfg. Co., Joliet, Ill.
 R1 Reeves Steel & Mfg. Co., Dover, O.
 R2 Reliance Div., Easton Mfg. Co., Massillon, O.
 R3 Republic Steel Corp., Cleveland
 R4 Roehling Sons Co., John A. Tremont, N. J.
 R5 Rotary Electric Steel Co., Detroit
 R6 Rodney Metals, Inc., New Bedford, Mass.
 R7 Rome Strip Steel Co., Rome, N. Y.
 S1 Sharon Steel Corp., Sharon, Pa.
 S2 Sheffield Steel Corp., Kansas City
 S3 Shenango Furnace Co., Pittsburgh
 S4 Simonds Saw & Steel Co., Fitchburg, Mass.
 S5 Sweet's Steel Co., Williamsport, Pa.
 S6 Standard Forging Corp., Chicago
 S7 Stanley Works, New Britain, Conn.
 S8 Superior Drawn Steel Co., Monaca, Pa.
 S9 Superior Steel Corp., Carnegie, Pa.
 S10 Seneca Steel Service, Buffalo
 T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
 T2 Tennessee Coal & Iron Div., Fairfield
 T3 Tennessee Products & Chem. Corp., Nashville
 T4 Thomas Strip Div., Warren, O.
 T5 Timken Steel & Tube Div., Canton, O.
 T6 Tremont Nail Co., Wareham, Mass.
 T7 Texas Steel Co., Fort Worth
 T8 Thompson Wire Co., Boston
 U1 United States Steel Corp., Pittsburgh
 U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
 U3 Ulbrich Stainless Steels, Wallingford, Conn.
 U4 U. S. Pipe & Foundry Co., Birmingham
 W1 Wallingford Steel Co., Wallingford, Conn.
 W2 Washington Steel Corp., Washington, Pa.
 W3 Weirton Steel Co., Weirton, W. Va.
 W4 Wheatland Tube Co., Wheatland, Pa.
 W5 Wheeling Steel Corp., Wheeling, W. Va.
 W6 Wickwire Spencer Steel Div., Buffalo
 W7 Wilson Steel & Wire Co., Chicago
 W8 Wisconsin Steel Co., S. Chicago, Ill.
 W9 Woodward Iron Co., Woodward, Ala.
 W10 Wycoff Steel Co., Pittsburgh
 W11 Worcester Pressed Steel Co., Worcester, Mass.
 Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per) l.o.b. mills. Base price about \$290 per net ton.

	BUTTWELD												SEAMLESS							
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2 in.		3 in.		3 1/2 in.		4 in.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
ARD T. & C.																				
Sparrows Pt. B3	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75	.....	.....	.....	.....	.....	.....
Youngstown R3	17.50	0.25	20.50	4.25	23.00	7.75	25.50	9.00	26.00	10.00	26.50	10.50	28.00	10.75	.....	.....	.....	.....	.....	.....
Fontana K1	6.00	+9.25	9.00	+5.25	11.50	+1.75	14.00	+1.00	14.50	+0.00	15.00	0.50	16.50	0.25	.....	.....	.....	.....	.....	.....
Pittsburgh J3	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Alton, Ill. L1	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75	.....	.....	.....	.....	.....	.....
Sauron M3	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....
Feldons N2	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75	.....	.....	.....	.....	.....	.....
Pittsburgh N1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Wheeling W5	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....
Wheatland W4	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....
Youngstown Y1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Indiana Harbor Y1	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75	.....	.....	.....	.....	.....	.....
Lorain N2	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. B3	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75	.....	.....	.....	.....	.....	.....
Youngstown R3	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75	.....	.....	.....	.....	.....	.....
Fairless N2	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75	.....	.....	.....	.....	.....	.....
Fontana K1	10.50	.....	14.50	.....	18.50	.....	17.00	.....	17.50	.....	18.00	.....	18.50	.....	.....	.....	.....	.....	.....	.....
Pittsburgh J3	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25
Alton, Ill. L1	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75	.....	.....	.....	.....	.....	.....
Sauron M3	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	.....	.....	.....	.....	.....	.....
Pittsburgh N1	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25
Wheeling W5	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	.....	.....	.....	.....	.....	.....
Wheatland W4	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	.....	.....	.....	.....	.....	.....
Youngstown Y1	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25
Indiana Harbor Y1	21.0	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75	.....	.....	.....	.....	.....	.....
Lorain N2	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25

Threads only, butt-weld and seamless 2 1/2 pt higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 4 1/2 pt higher discount. Butt-weld jobbers discount, 5 pt. Galvanized discounts based on zinc price range of over 94 to 114 per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2, 1 3/4 and 2 in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 114 to 134 would lower discounts; zinc price in range over 74 to 94 would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

Steel Prices (Effective Sept. 20, 1955)

To identify producers, see Key on preceding page

MERCHANT WIRE PRODUCTS

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Balls Treated
Bessemer U1	4.725	5.45	5.825				
So. Chicago R3		5.45		7.50			
Enders T2	4.725	5.45			5.825		
Fairfield T2	4.725	5.45	7.50		5.825		
Gary U1					5.825		
Ind. Harbor J3	4.725	5.825	7.50		5.525		
Johnstown B3		5.825					
Joliet U1		5.825					
Kansas City S3				7.90			
Lackawanna B3	4.725	5.825			5.825		
Minnesota C3	4.725	6.15	5.825	7.50	5.825	12.40	
Pittsburgh O1						11.90	12.40
Pittsburgh P3							12.40
Pittsburgh J3				7.90			
Seattle B2			5.40		5.775	12.90	
Steelton B3	4.725	5.825			5.825		
Struthers Y1				7.90			
Terrace C7					5.775		
Williamsport S3		5.40					
Youngstown R3				7.90			

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb.	22-Gage Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi- Processed	Fully Processed
Field	8.40	8.60	
Armstrong	9.25	9.60	10.10
Elect.	9.95	10.20	10.70
Malar	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain Oriented	
Trans. 58	13.85	Trans. 60	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing plants: Beach Bottom (W3); Brackensridge (A3); Granite City (G7); Indiana Harbor (I3); Mansfield (E3); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U); Warren, O. (R3); Zanesville (A7).

* Coils 73½ higher.

F.o.b. Mill	Standard & Coated Nails		Standard Wire		Fence Posts		Single Loop Bolo Ties		Galv. Barbed and Twisted Barbed Wire		Merch. Wire Ann'd		Merch. Wire Galv.	
	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal
Alabama City R3	152	162			173	175	7.40	7.80						
Albion, Pa. J3	152	162					7.40	7.80						
Atlanta A8	154	167			175	180	7.50	8.025						
Bartonsville K2*	154	168			175	181	7.50	8.075						
Buffalo W6							7.40	7.80						
Chicago, Ill. N4**	152	166			173	179	7.40	8.00						
Cleveland A5	157						7.40							
Crawfordsville M4*	154	167			175	175	7.50	8.05						
Donora, Pa. A5	152	162			173	175	7.40	7.90						
Duluth A3	152	162			173	175	7.40	7.90						
Fairfield, Ala. T2	152	162			173	175	7.40	7.90						
Galveston D4	157													
Houston S2	167	178			180	180	7.65	8.00						
Johnstown, Pa. B3*	152	168			175	175	7.40	7.90						
Joliet, Ill. A3	152	162			173	175	7.40	7.90						
Kokomo, Ind. C9	154	154			175	177	7.50	7.90						
Los Angeles B2*							8.35	8.925						
Kansas City S2	167	174			178	180	7.65	8.05						
Minneapolis C6	157	167	162	178	180	180	7.65	8.05						
Monessen P6	152	162					7.40	7.90						
Moline, Ill. R3	162	162												
Pittsburgh, Cal. C7	171	185			195	195	8.35	8.75						
Portsmouth P7							7.40							
Rankin, Pa. A3	152	162			175	175	7.40	7.90						
So. Chicago R3	152	162	157	173	175	175	7.40	7.90						
S. San Francisco C6					197	195	8.35	8.75						
Sparrows Pt. B3*	154				175	181	7.50	8.075						
Struthers, O. Y1							7.40	7.90						
Warren, O. A3	158						7.70							
Williamsport, Pa. S3		160												

Galvanized products computed with zinc at 5¢ per lb. Exceptions: * zinc at 12.5¢ per lb; **13¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.24-0.40	0.41-0.60	0.61-0.80	0.81-1.00	1.01-1.35
Buffalo, N. Y. R7	7.00	8.95	10.50	12.45	15.35
Carnegie, Pa. S9		8.95	10.50	12.45	15.35
Cleveland A5	7.00	8.95	10.50	12.45	15.35
Detroit D1	7.10	9.05	10.60	12.75	
Detroit D2	7.10	9.05	10.60		
Harrison, N. J. C11		10.80	12.95	15.35	
Indianapolis C3	7.15	9.10	10.50	12.45	15.35
New Castle, Pa. B4	7.00	8.95	10.50	12.45	
New Haven, Conn. D1	7.45	9.25	10.80	12.95	
Pawtucket, R. I. N7	7.55	9.25	10.80	12.95	15.65
Pittsburgh S2	7.00	8.95	10.50	12.45	15.35
Riverdale, Ill. A1	7.10	8.95	10.50	12.45	15.35
Sharon, Pa. S1	7.00	8.95	10.50	12.45	15.35
Trenton R4					
Wallingford W1	7.45	9.25	10.80	12.95	15.65
Warren, Ohio T4	7.00	8.95	10.50	12.45	15.35
Weirton, W. Va. W3	7.10	8.95	10.50		
Worcester, Mass. A3	7.85	9.25	10.80	12.95	15.65
Youngstown C3	7.00	8.95	10.50	12.45	15.35

BOILER TUBES

5 per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size		Seamless		Elec. Weld	
	OD- In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.94	.....
	2½	12	41.57	49.16	40.31	.....
	3	12	47.99	56.76	46.54	.....
	3½	11	56.03	66.27	54.34	.....
	4	10	74.41	88.00	72.16	.....
National Tube	2	13	30.87	36.51	29.94	.....
	2½	12	42.57	49.16	40.31	.....
	3	12	47.99	56.76	46.54	.....
	3½	11	56.03	66.27	54.34	.....
	4	10	74.41	88.00	72.16	.....
Pittsburgh Steel	2	13	30.87	36.51	.....	.....
	2½	12	41.57	49.16	.....	.....
	3	12	47.99	56.76	.....	.....
	3½	11	56.03	66.27	.....	.....
	4	10	74.41	88.00	.....	.....

WARE-HOUSES

City	City Delivery Charge	Base price, f.o.b., dollars per 100 lb.											
		Sheets		Strip		Plates/Shapes		Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled 4615	Hot-Rolled 4615 As rolled	Cold-Drawn 4140	Cold-Drawn 4140 As rolled
Baltimore	9.10	7.65	8.32	9.10	7.65		7.21	7.93	7.61	8.62	14.38	13.44	16.20
Birmingham	15	8.80	7.63	8.85	7.66		6.99	7.28	7.08	9.95		13.98	16.49
Boston	10	7.70	8.81	10.27	7.94	10.30	7.99	8.13	7.83	9.53	13.45	13.40	16.50
Buffalo	30	6.80	6.85	9.77	7.15		7.15	7.40	7.10	7.90		13.10	16.15
Chicago	25	6.80	6.34	8.50	7.06		6.99	7.28	7.08	7.75	13.20	12.85	16.05
Cincinnati	25	6.92	6.33	9.50	7.30		7.28	7.75	7.32	8.05	13.44	13.09	16.20
Cleveland	30	6.80	6.30	8.85	7.16		7.16	7.61	7.14	7.85		12.91	15.96
Denver		8.60	10.00	11.22	8.90		8.60	8.75	8.90	9.82			17.97
Detroit	25	6.99	6.53	8.78	7.34	8.15	7.27	7.75	7.38	8.04	13.40	13.05	16.10
Houston		7.85	8.75	10.49	8.15		7.80	8.20	8.25	9.85	14.35	14.00	17.15
Kansas City	20	7.47	8.00	9.17	7.73		7.44	7.90	7.75	8.82		13.52	
Los Angeles	10	8.05	10.00	11.00	8.35		8.05	8.30	8.05	11.25		14.25	17.85
Memphis	10	7.12	8.25		7.38		7.31	7.60	7.40	9.15			
Millwaukee	25	6.99	6.43	8.59	7.15		7.00	7.45	7.17	7.94		12.94	15.99
New Orleans	15	7.20	8.35		7.45		7.40	7.70	7.50	9.00			
New York	10	7.45	8.68	9.44	8.07	9.95	7.70	7.99	7.96	9.48	13.63	13.28	16.48
Norfolk	20	7.25			7.65		7.45	7.95	7.65	9.50			
Philadelphia	10	7.14	8.42	9.35	7.67		7.37	7.74	7.64	8.46	13.51	13.16	16.36
Pittsburgh	25	6.80	6.34	9.20	7.16	9.00	6.99	7.28	7.08	7.85	13.20	12.85	16.05
Portland		7.80	8.80	10.65	8.00		7.75	7.85	7.95	11.80		15.00	17.50
Salt Lake City	20		10.60		9.35			9.20	9.15				
San Francisco	10	8.10	9.65	10.15	8.35		8.05	8.25	8.05	11.20*		14.25	17.85
Seattle	90	8.95	10.40	10.80	8.65		8.20	8.30	8.35	11.70		14.00	17.65
St. Louis	25	7.00	8.63	9.19	7.35		7.28	7.68	7.37	8.14	13.49	13.14	16.25
St. Paul	23	7.46	8.29	9.18	7.72		7.65	7.94	7.74	8.51		13.51	16.38

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity. Exceptions: (1) 1800 to 9999 lb. (2) 1000 lb or over. (3) \$2.50 delivery. (4) 1000 to 1999 lb. \$2.50 delivery. * Plus analysis charge.

Miscellaneous Prices

(Effective Sept. 20, 1955)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.60
18	4	1	—	8	2.305
18	4	1	—	—	1.765
1.6	4	1.5	8	—	.98
8	4	2	8	—	1.35
8	4	2	8	—	1.105

High-carbon chromium77
Oil hardened manganese45
Special carbon39
Extra carbon33
Regular carbon275
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb, f.o.b.

Cladding	Plate (A3, J2, L4)			Sheet (J2)	
	10 gal	15 gal	20 gal	20 gal	
304	26.30	33.15	36.05	32.50	
316	35.50	38.45	41.40	47.00	
321	32.00	34.85	37.75	37.25	
347	34.40	37.90	41.40	48.25	
405	25.80	29.60	33.35		
410, 430	25.30	29.10	32.85		

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	\$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$13.00 to \$13.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	24.60
Detroit, f.o.b.	26.25
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.50
Philadelphia, f.o.b.	24.00
Swedeland, Pa. f.o.b.	24.00
Plainsville, Ohio, f.o.b.	25.50
Erie, Pa. f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
6	60	27.25	12	60	11.75
4	60	30.25	10	60	11.80
3	60	32.00	8	60	12.10
2 1/2	30	33.75			
2	24	\$2.50			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discount	Less Case C.
1/2 in. & smaller x 4 in. & shorter	+5	17
1/2 in. & smaller x 6 in. & shorter	+12	11
9/16 in. & 5/8 in. x 6 in. & shorter	+13	10
1/2 in. & larger x 6 in. & shorter	+16	7
All diam. longer than 6 in.	+25	net
Rolled thread carriage bolts		
1/2 in. & smaller x 6 in. and shorter	+10	12
Lag, all diam. x 6 in. & shorter	+3	18
Lag, all diam. longer than 6 in.	+11	12
Plow bolts	+18	18

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Case or Keg
1/2" or smaller	55	64
3/4" to 1 1/4" inclusive	55	63
1 1/2" to 1 3/4" inclusive	57	65
1 3/4" and larger	61	61
C.P. Hex. regular & hvy.		
1/2" and smaller	55	64
3/4" and larger	61	61
Hot Galv Nuts (all types)		
1/2" or smaller	58	50
3/4" to 1 1/4" inclusive	58	49

Finished, Semi-finished, Slotted or Case-tempered Nuts

1/2" and smaller	55	66
3/4" and larger	61	63

Rivets

	Base per 100 lb	Pct Off List
1/2 in. and larger	\$9.95	
7/16 in. and smaller		32

Cap Screws

	Discount	H.C. Heat Bright Treated
New std. hex head, pack- aged		
1/2" thru 1 1/2" diam. x 6"	34	20
9/16 and 5/8 x 6" and smaller and shorter	31	16
1 1/2" thru 1 3/4" x 6" and shorter	8	+11
New std. hex head, bulk		
1/2" thru 1 1/2" diam. x 6"	49	41
9/16 and 5/8 diam. x 6"	48	39
1 1/2" thru 1 3/4" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces 1/2", 5/16", 3/8" diam.
5,000 pieces 7/16", 1/2", 5/16", 3/8" diam.
2,000 pieces 3/4", 1", 1 1/2" diam.

Machine Screws & Stove Bolts

	Discount	Mach. Screws	Stove Bolts
Packaged, package list		27	33
Bulk, bulk list			
1/4 in. diam. & under 5/16 in. diam. & larger	25,000-200,000	20	61
All diam. over 5/16 in. long	15,000-100,000	20	61
	5,000-100,000		61

Machine Screw & Stove Bolt Nuts

		Discount	
		Hex	Square
Packaged, package list . . .		24	27
Bulk, bulk list			
Quantity			
% -in. diam. & smaller	35,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.5
Chicago	126.0
San Francisco-L. A.	131.1

August 1955 value, Class B or heavier, 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$6.00)	\$122.00
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$128.00
Childs, Hays, Pa.	133.00
Chicago District	138.00
Western Utah	
California	
Super Duty	
Hays, Pa., Athens, Tex., Wind- ham	148.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, East- ern (except Hays, Pa.)	31.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chi- cago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	

Chrome Brick

	Per net ton
Standard chemically bonded, Balt.	\$86.00
Standards chemically bonded, Cur- tner, Calif.	96.00
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	\$109.00
Chemically bonded, Baltimore	97.00

Grain Magnesite

	St. 1/4-in., gross
Domestic, f.o.b. Baltimore	
in bulk fines removed	\$64.40
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	
in bulk	40.00
in sacks	46.00

Dead Burned Dolomite

	Per net ton
F.o.b. bulk, producing points in: Pa., W. Va., Ohio	\$16.00
Midwest	15.00
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.	
New York, ocean bags	11.250
Canadian sponge iron, Del'd in East, carloads	9.50
Domestic sponge iron, 98+% Fe, carload lots	9.50
Electrolytic iron, annealed, imported 99.5+% Fe	27.50
domestic 99.5+% Fe	26.50
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.50
Hydrogen reduced iron min- us 300 mesh, 98+% Fe	62.00 to 80.00
Carbonyl iron, size 5 to 10 micron, 98%, 90.8+% Fe	83.00 to 11.40
Aluminum	31.50
Brass, 10 ton lots	29.50 to 36.50
Copper, electrolytic	57.750
Copper, reduced	57.750
Cadmium, 100-199 lb. 98% plus metal value	
Chromium, electrolytic, 99% min. and quality, del'd	33.00
Lead	23.500
Manganese	57.00
Molybdenum, 99%	32.75
Nickel, unannealed	99.500
Nickel, annealed	96.500
Nickel, spherical, unannealed	93.500
Silicon	43.500
Solder powder 7.00 to 9.00 plus met. value	
Stainless steel, 302	91.00
Stainless steel, 316	81.10
Tin	14.000 plus metal value
Tungsten, 99% (65 mesh)	44.50
Zinc, 10 ton lots	17.50 to 25.00

Ferroalloy Prices

(Effective Sept. 20, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, 30-1.00% max. Si.
 0.02% C ... 36.50* 0.20% C ... 35.50*
 0.05% C ... 36.50* 0.50% C ... 35.25*
 0.10% C ... 36.00* 1.00% C ... 34.00*
 0.15% C ... 35.75* 2.00% C ... 32.75*
 4.00-4.50 C, 67.70% Cr, 1-2% Si ... 26.25
 5.50-6.00% C, 57-64% Cr, 2.00-4.00% Si ... 25.00

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
 Carloads ... 28.65*
 Ton lots ... 30.55*
 Less ton lots ... 32.05*

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.
 0.10% max. C ... 31.27*
 0.50% max. C ... 1.37*
 9 to 11% C, 88-91% Cr, 0.75% Fe ... 1.36*

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.)
 Contract price, carloads, delivered, lump, 2-in. x down, per lb of Cr, packed.
 Carloads ... 41.85*
 Ton lots ... 46.15*
 Less ton lots ... 48.65*

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
 30-33% Cr, 60-65% Si, 3.00 max. Fe.
 Carloads ... 22.95*
 Ton lots ... 25.25*
 Less ton lots ... 26.75*

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
 14-20% Ca, 14-18% Mn, 53-59% Si.
 Carloads ... 23.05*
 Ton lots ... 24.95*
 Less ton lots ... 25.95*

EMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.
 Ton lots ... 19.65
 Less ton lots ... 20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
 Carload lots ... 16.60
 Ton lots ... 18.10
 Less ton lots ... 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 53%, Ti 9 to 11%, Ca 6 to 7%.
 Carload packed ... 17.50
 Ton lots to carload packed ... 18.25
 Less ton lots ... 19.50

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.
 Producing Point

Producing Point	Cents per lb
Marietta, Ashabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50
Add or subtract 0.14 for each 1 pct Mn above or below base content.	
Briquets, delivered, 4¢ pct Mn;	
Carloads, bulk	12.10*
Ton lots packed	14.30*

* Effective Oct. 1, 1955.

Spiegelisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.
 Manganese Silicon
 16 to 19% 3% max. ... \$54.00
 19 to 21% 3% max. ... 56.00
 21 to 23% 3% max. ... 58.50
 23 to 25% 3% max. ... 61.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
 95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
 Carload, packed ... 45.00
 Ton lots ... 43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
 Carloads ... 30.00
 Ton lots ... 32.00
 250 to 1999 lb ... 34.00
 Premium for hydrogen - removed metal ... 0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 21.85*

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.
 Carloads Ton Less
 0.07% max. C, 0.06% P, 90% Mn ... 32.00 32.25 35.05
 0.17% max. C ... 32.95 31.80 33.80
 0.15% max. C ... 32.45 30.30 31.50
 0.30% max. C ... 32.95 28.80 30.00
 0.50% max. C ... 26.45 28.20 29.50
 0.75% max. C, 80-85% Mn, 5.0-7.0% Si ... 23.45 25.30 26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.
 Carload bulk ... 11.20*
 Ton lots ... 12.65*
 Briquet contract basis carloads, bulk, delivered, per lb of briquet ... 12.70*
 Ton lots, packed ... 14.90*

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk Iowa, or Wenatchee, Wash., \$87.50 gross ton, freight allowed to normal trade area.
 Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$90.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.
 Ton lots Carloads
 96.50% Si, 2% Fe ... 22.75* 21.45*
 98% Si, 1% Fe ... 23.25* 21.95*

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.
 Carloads, bulk ... 6.75*
 Ton lots, packed ... 9.35*

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.
 50% Si ... 11.75 75% Si ... 15.40*
 65% Si ... 14.50 85% Si ... 17.10*
 90% Si ... 18.50*

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.
 Cast Turnings Distilled
 Ton lots ... 22.05 23.25 23.75
 Less ton lots ... 2.40 3.30 4.55

Ferrovandium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.
 Openhearth ... 3.10*
 Crucible ... 3.10*
 High speed steel (Primos) ... 3.30*

Alifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ... 10.35¢
 Ton lots ... 11.50¢
 Calcium molybdate, 46.3-46.6% f.o.b. Langloeth, Pa., per pound contained Mo ... \$1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.
 Ton lots ... \$6.90
 Less ton lots ... 6.91

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta ... \$4.65

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langloeth, Pa., per pound contained Mo ... \$1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton ... \$90.00
 10 tons to less carload ... \$110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.33

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.50
 Less ton lots ... \$1.52

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... \$177.00

Ferrotungsten, 1/2 x down, packed, per pound contained W, ton lots, f.o.b. ... \$3.45

Molybde oxide, briquets, per lb contained Mo, f.o.b. Langloeth, Pa. ... \$1.27
 bags, f.o.b. Washington, Pa., Langloeth, Pa. ... \$1.24

Simanal, 20% Si, 30% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk lump ... 15.50¢
 Ton lots, packed lump ... 16.75¢
 Less ton lots, lump packed ... 17.25¢

Vanadium Oxide, 86 - 89% V₂O₅ contract basis, per pound contained V₂O₅ ... \$1.33*

Zirconium contract basis, per lb of alloy.
 25-40% f.o.b. freight allowed, carloads, packed ... 26.25¢*
 12-15% del'd, lump, bulk carloads ... 8.50¢*

Boron Agents

Boreasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3.14%, Si, 40-45%, per lb contained B ... \$5.26

Bortum, f.o.b. Niagara Falls
 Ton lots, per pound ... 45¢
 Less ton lots, per pound ... 50¢

Corbortum, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ... 10.00¢
 Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ... \$1.30

F.o.b. Wash., Pa.; 100 lb up 10 to 14% B85
 14 to 19% B ... 1.20
 19% min. B ... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over
 No. 1 ... \$1.00
 No. 79 ... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
 Ton lots ... \$1.48
 Less ton lots ... 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Fe, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... \$2.00

Silica, contract basis, delivered.
 Ton lots ... 45.00¢

Massey-Harris-Ferguson eliminates reworking of finished pieces with Surfindicator. This production tool cuts their machining cost.



"SURFINDICATOR* cuts our costs
by eliminating extra machining"

The Brush SURFINDICATOR enables the operator to measure, at the machine, the exact surface finish which he is producing. Thus, it allows him to take necessary steps to make this the optimum surface finish from a cost to performance standpoint. The surface finish of these farm implement parts is checked right on the production floor at Massey-Harris-Ferguson Inc., Racine, Wisconsin.

They state: "Using the SURFINDICATOR, we can immediately see if parts are within the range of design specifications for finish. Considerable machining time and cost has been saved by eliminating reworking of finished pieces to meet specifications. The Surfindicator is an asset to our work because of its portability and simple direct measurement."

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Cleveland 14, Ohio

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- ☐ Please have your representative call and demonstrate the SURFINDICATOR.

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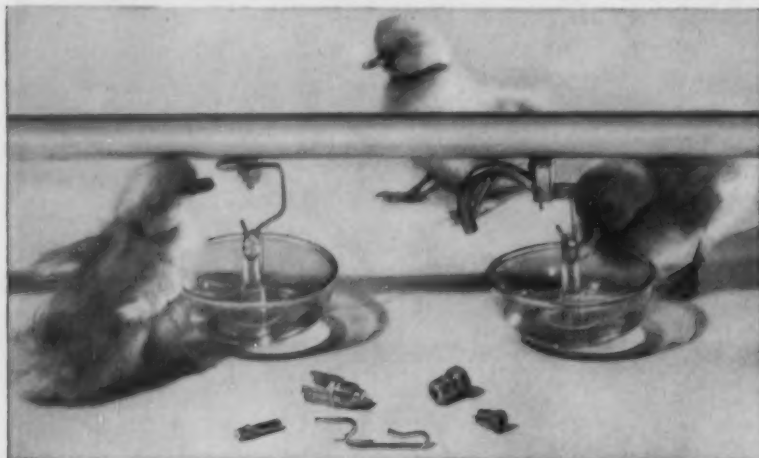
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BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

BRIDGEPORT
CO.

Reporting new developments in copper-base alloys and metalworking methods.



Brass valve components help give these ducklings a clean, cool and continuous water supply.

Automatic Drinking Fountains for Poultry Use Brass for Dependable Service

A good supply of clean, cool water helps to produce steady chick growth and good eggs, but the problem is to water poultry adequately without spillage, flooding, and, in the case of chicks, drowning.

A solution to this problem is the ingenious automatic drinking fountains made by Drinxall Manufacturing Company of North Hollywood, California.

With parts fabricated from Bridgeport copper-base alloys to Drinxall's own design, these poultry fountains are self-filling and sanitary. Poultry can't get in, nor water out, and chicks do their drinking right in pens, batteries or cages.

Drinking cups are suspended from water-supply lines by valves made from Bridgeport Free-Cutting Brass Rod Alloy 6 and by wire clips of Bridgeport Spring Brass Alloy 37. When water gets low in the plastic cups, a counterweight opens a supply valve until water reaches the proper drinking level, when the counterweight causes the valve to close.

Drinxall also uses Bridgeport copper-base alloys for a fountain using a peck-type valve, the valve opening when poultry peck at the moist valve stem.

The small, yet accurately made parts for the Drinxall valves shown are made from Bridgeport Free-Cutting Brass

Rod Alloy 6. A composition of 61% copper and 3.4% lead gives this alloy exceptionally free-machining properties and a uniform composition. The use of Bridgeport Alloy 6 also assures accurate dimensions, essential in close-tolerance parts such as the small Drinxall valves shown above. Bridgeport Free-Cutting Rod Alloy 6 gives manufacturers a fast-production alloy ideal for high-speed, economical machining. Its strength and uniform composition serve close-tolerance requirements and make it particularly suitable for valves. Precision finishing assures efficient functioning, including perfect closing of metal-to-metal valve seats.

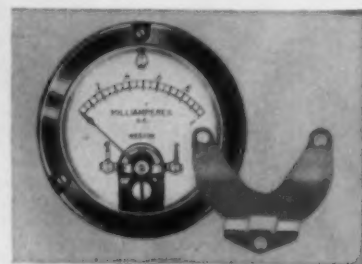
Bridgeport Copper Alloys were selected for Drinxall fountains because of their uniform high inner quality and consistent conformity with specifications covering composition, temper, finish and dimensions.

In thousands of cases such as this one, Bridgeport Technical Service representatives studied the requirements of an application, then recommended materials that have given satisfaction to manufacturers and customers alike.

Bridgeport Technical Service will recommend the alloys best suited to your particular applications, manufacturing methods, and production requirements. Call your local Bridgeport office for this helpful advice.

Magnet Holders Stamped from BRIDGEPORT Nickel Silver Withstand Rugged Use, Meet High Standards

To insure that the ruggedized meters it manufactures are able to withstand hard use, Weston Electrical Instrument Corp., Newark, New Jersey, uses only the sturdiest of materials. In addition, these Weston instruments are tested on machines such as a 2,000 foot-pound shock-testing machine and various vibration-testing machines.



Weston Milli Ammeter Model 1521 uses the Nickel Silver Magnet Retainer inset at right.

A typical Weston part is the magnet retainer (shown above) stamped and formed from Bridgeport Nickel Silver Grade B 555. This alloy has high strength and corrosion resistance, plus good spring properties and high electrical resistance. These properties make Bridgeport Nickel Silver B 555 ideal for telephone boards, radio parts, electrical controls, optical goods, surgical and dental instruments, and diaphragms.

Weston's magnet holder is formed so that its base has a slight buckle which flattens when the holder is fastened to the instrument housing. Permanent spring action of Bridgeport Alloy B 555 secures the magnet holder.

In this application, as in others, the selection of suitable Bridgeport alloys was made after Bridgeport's technical service and laboratory experts studied the metalworking requirements of the manufacturer, then recommended the exact alloy, temper, finish and size—not only to meet specifications, but to assure product quality and sales acceptance.

Bridgeport's helpful services . . . and 90 years of metalworking experience . . . are available to you through the nearest Bridgeport sales representative. (3970)



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and get "More Use per Dollar"

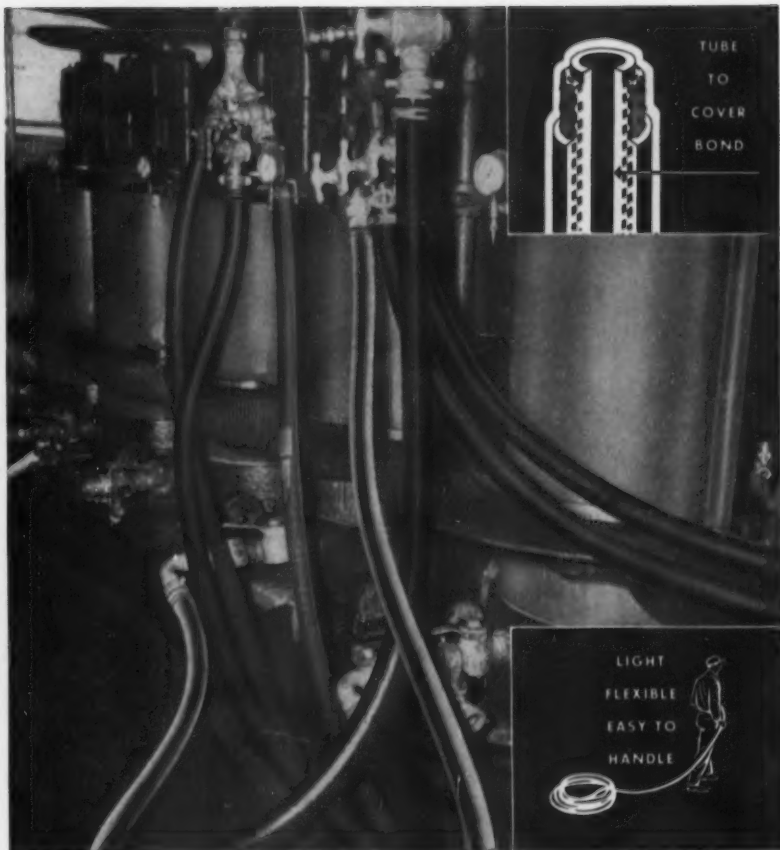
Select a light weight hose construction that is flexible and kink resistant for long-life dependability.

Hose that is light in weight—yet strong enough to safely withstand high pressures—is easier to handle. Men like it better and do more work with it. Look for a hose that is light, yet strong, for ease of handling.

If the hose you buy resists kinking you are assured maximum flow under all operating conditions. Hose that is mandrel-made, rather than molded in a pre-set coil, will coil and uncoil freely in any direction . . . eliminate points of strain at kinking points that can cause costly internal damage and rupture.

Make certain the hose is engineered for maximum flexibility . . . from tube to cover. Tube-to-cover flexibility prevents separation of cover, tube or strength member plies . . . reduces hose costs by increasing hose life.

Specify the one hose that gives you all these features . . . specify R/M Homoflex Hose.



HOMOFLEX HOSE

The unique construction of Homoflex Hose makes it easier to handle because it is light, has no pre-set twist . . . coils and uncoils easily without kinking. All unneeded bulk has been engineered out. An exclusive process creates a homogeneous cover, strength member and tube that are virtually inseparable to produce a hose construction that is extremely flexible, yet rugged

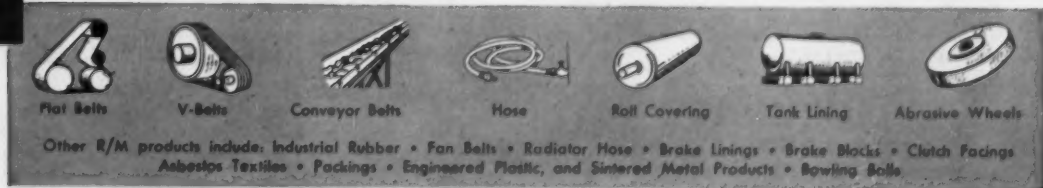
and strong. Homoflex Hose does a better job under tough conditions . . . and it lasts longer. Inside and outside diameters are uniform.

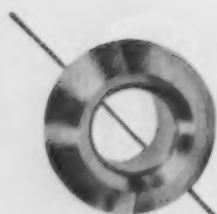
Ask your R/M representative about types of Homoflex Hose for your operations. He can also tell you why other types of R/M Hose for general and special purposes last longer, too . . . give you "More Use per Dollar".

RM-505-P

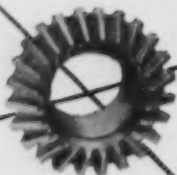


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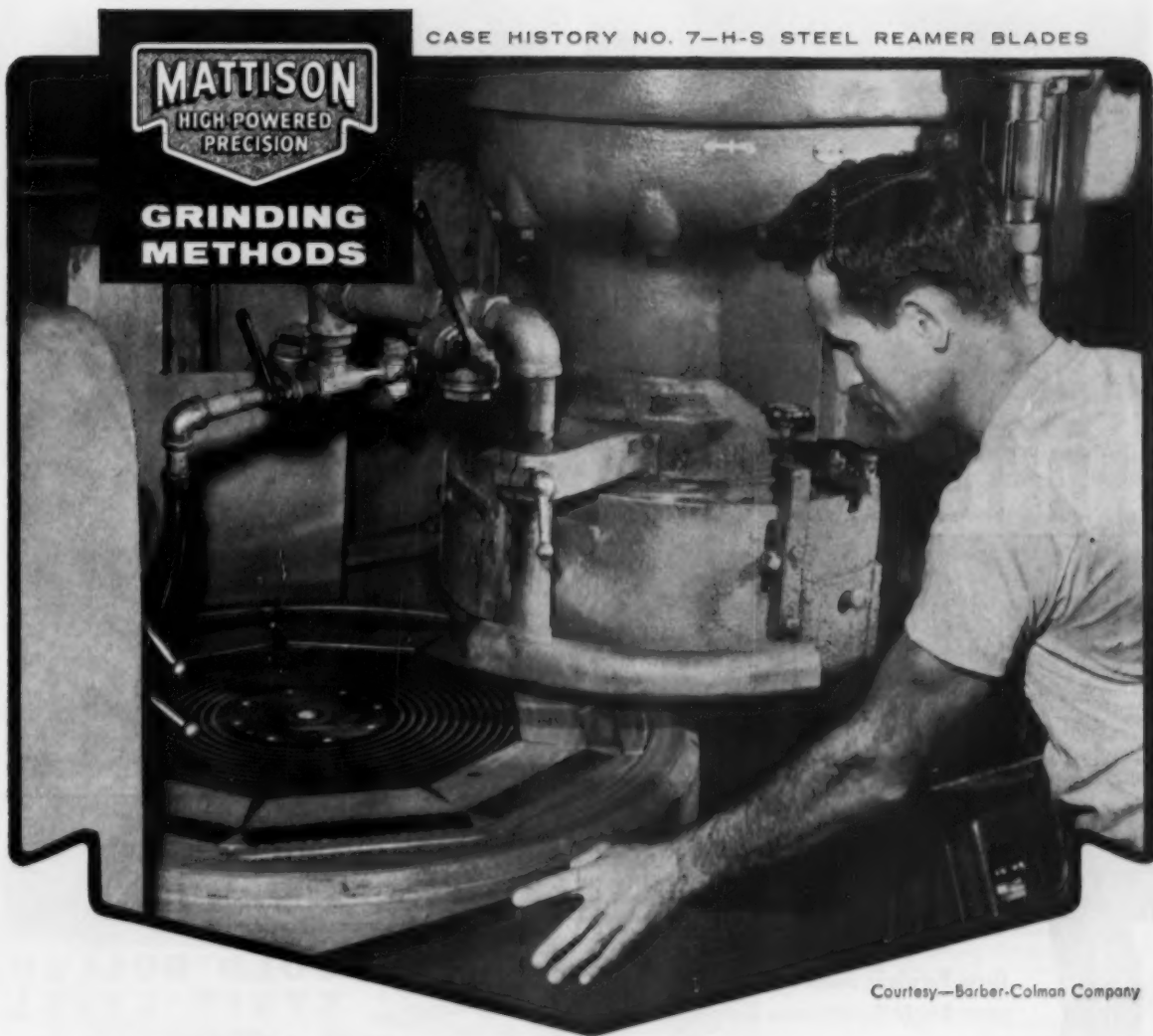
British Engineering Group of Companies, manufacturers and producers of heavy engineering equipment, with world-wide reputation and established over a century, has medium-heavy capacity available all types castings, forgings, plate fabrication, machining and erection, and seeks additional products to manufacture under license preferably where selling arrangements for Great Britain and the Sterling Area already established. Capital available. Highest references given and required.

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PRECISION

**GRINDING
METHODS**



Courtesy—Barber-Colman Company

Grinds 262 reamer blades per load

... holds size and flatness within .0003"



Unretouched photo, with blade purposely lighted to exaggerate cross-grind finish, which averages 10-12 micro inches, r.m.s.

For over ten years the Mattison No. 36 Vertical Rotary Surface Grinder has finish ground these hardened reamer blades without loss of accuracy.

On the job shown, for example, 262 blades are ground per load on both sides, holding size and flatness within .0003"—easily under the .0005" limit. Blades are M-3 (Type 1) high-speed steel. Spindle is set at 90° to the chuck. User reports exceptional cross-grind finish (averaging between 10 and 12 micro inches, r.m.s.) using a 60 grit segmental wheel.

The reason Mattison Grinders give

you greater accuracy *longer* is quite simple. The extra-heavy and extra-wide vertical column is *one* solid piece, bolted to the end of the base. "V" and flat column ways are longer, wider, and thicker. This prevents the wheel head slide from binding and "cramping," and permits the machine to feed accurately in increments as fine as .0001". The wheel head adjustment is close to the spindle, too, which simplifies "tilting" and promotes accurate grinding on a wider variety of work. Write for Bulletins 144 and 146 describing the numbers 24 and 36 Vertical Surface Grinders.

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BOSTON, MASS.



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PRECISION
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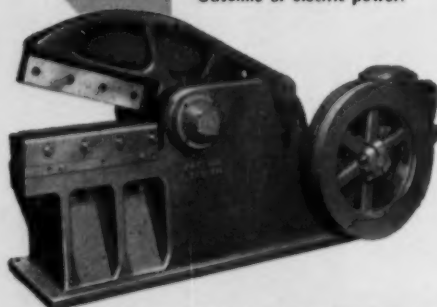
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SHEARS**

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2 SMOOTH, CLEAN CUTS Unusually smooth, clean cuts are obtained because of Steelweld's exclusive pivoted-blade cutting action. The upper knife travels in a circular path and pulls away from lower knife immediately after shearing. This prevents binding of cut pieces between back gauge and knife. Knife wear is reduced.

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5 MAXIMUM PRODUCTION Steelweld Shears are built for heavy-duty high production work. The one-piece welded steel frame and all operating details are liberally designed to provide extra stamina. Servicing is simple. All parts are easily accessible. As a result, downtime is minimum and production maximum.

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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

West Does Well . . . On the West Coast—from the Canadian to Mexican borders—used machinery dealers are doing a lively business. They look for it to keep up well into 1956.

Without the customary summer-time slack-off this year, dealers already have a running start into the fall season.

Demand for all types of equipment remains strong. Supplies are holding up. But you hear of dealers making more-than-occasional purchases in the East.

Clap Hands . . . San Francisco, Portland, Ore., and Seattle have good reason to clap their hands. Word from the Navy shows shipyards in these areas can expect to step up activities for the next few years. A good piece of the Navy's budget next year will come to West Coast yards where work's been badly needed. (See **THE IRON AGE**, "West Coast Report," Sept. 8, 1955.)

Many machine shops and metal fabricating companies here serving naval and private shipyards are beginning to update equipment. Used machinery dealers in San Francisco and Seattle are even moving some of their older stuff.

Navy Converts . . . The Navy work calls for building and converting ships for highly specialized uses: radar picket vessels and guided-missile-launching frigates. Dealers look for this to stir up more need for machinery that goes into electronics making: sheet metal equipment and small-sized high-precision machine tools.

Here's how two top Seattle-area dealers see the picture today:

"Some lines of new equipment are awfully slow coming from the East—over a year for delivery. That's good for us. More inquiries are coming in because shops need

better equipment now or in the next few months—can't wait a year for new tools."

"All machinery sales are quite brisk. Power presses are in short supply and lathes are becoming scarce."

Bay Booms . . . In the San Francisco Bay Area, business continues on the upswing. The degree of swing varies with the dealer checked:

"We expect our third quarter to wind up about one-third ahead of the same period 1954. And the year'll end up with a similar one-third gain."

Another outfit calls business "about normal . . . volume equal to or a little ahead of last year." This dealer, too, predicts a gain for the year over 1954.

Top sellers in San Francisco: standard tools, milling machines, boring mills. Supplies of all equipment are adequate. Prices holding firm.

Dealers Must Step . . . Southern California dealers are bustling to keep up with the demand. Behind this activity: more and more new and expanding companies in the area.

While the supply of good late-model tools is limited, there's no problem yet meeting the need.

Sheet metal machinery is still the best-moving class of equipment. Most calls are for punch presses, press brakes, and shears. There's some pickup in sales of small and medium welding equipment to go with the sheet metal machinery.

Machine tools are moving well. There's more buying by the automotive industry, especially grinders and automatic lathes. Need for planers to convert to skin-milling machines—hot items in the aircraft industry for months—now seems to be cooling off.

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8" x 3/16" Hotchkiss Initial Type
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20" x 1/4" Hillis & Jones Pyramid Type Bending Roll

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8" x 1/4" Drive & Crump Size 180
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BRAKES—PRESS TYPE

12" All Steel Press Brake, 250 ton Capacity
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5 ton P&H Trer-Lift 20' Span 220/440 A.C.
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5 ton Cleveland 90' Span 220 Volt D.C.
10 ton P&H 35' Span 220 Volt D.C.
10 ton Niles 52' Span 220 Volt D.C.
10 ton Shaw 72' Span 220 Volt D.C.
10 ton Northern 90' Span 220 Volt D.C.
10 ton P&H 50' Span 220 Volt D.C.
15 ton P&H 75' Span 220 Volt D.C.
20 ton P&H 80' Span 220 Volt D.C.
20 ton P&H 60' Span 220 Volt D.C.
30 ton Toledo 75' Span 550/3/80 A.C.

DIEING MACHINE

20 ton Henry & Wright, 1 1/2" Stroke, Double Roll Feed, Scrap Shear

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50,000 lb. Standard Double Draw, 48" Length of Draw
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500 ton HPM Fastraverse Press, 24" Stroke Pressing Area 36"x36". Max. Daylight 42"
1200 ton Birdboro 4-Column, 20" Stroke Dist. Bet. Columns 20" x 20", Daylight 42"
1257 ton Baldwin Southwark Forging Press, 20" Stroke Main Ram, 54" x 41" Bet. Columns
1200 ton Lake Erie 4-Column, 24" Stroke 48x48" Bet. Columns, 12" Rtol, Overall of Bed
2045 ton Birdboro 4-Columns, 14" Stroke Platen 42" x 40", Daylight 47"

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80" x 3/4" Fels

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48x12" Long & Allstatter Sine B
48x12" Long & Allstatter Sine C

SHEARS—BAR

20 Buffalo Bar Cutter, Capacity 2" Sq., 3 1/2" Rd.

SHEARS—ROTARY

3/16" Quickwork Rotary Shear, 36" Throat
4" Kiling #250, With Flanging Attachment
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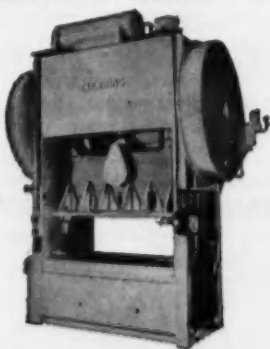
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No. 1, 2 Cincinnati Acme Full Universal, m.d.
No. 2A Warner & Swasey, m.d., bar, 1944
No. 2F Foster Fastermatic, m.d., Timken
No. 2G Morey, 1" cap., bar
No. 2L Gisholt Universal, m.d., latest type, 1945
No. 3 Cincinnati Acme Full Universal, m.d., chucking
No. 3 Jones & Lamson, 1 1/2" capacity, Full Universal, m.d.
No. 3 Warner & Swasey, m.d., 1943
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No. 3A Warner & Swasey, m.d., 1942
No. 3F Foster Fastermatic, m.d., Timken

No. 4 Warner & Swasey, cone, bar and chucking types
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No. 4 Warner & Swasey, preselector head, m.d., 1942
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No. 4L Gisholt, Universal, m.d., 1943
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1-2-3-4-5-6 kmc type plain & vertical.
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O.B.I. PRESSES: (18) MINSTER #7 - #5 - #4 - #3 all late 1941 to 1945, V. and O #50.

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GRINDERS, SURFACE: THOMPSON 14" x 40" type C twin wheel, new 1952. (6) REID, B&S, ABRASIVE and WILMARTH and MARMAN magnetic.

PROD. LATHES: (35) LEBLOND rapid prod. and "multi-cut" 13" to 26". (8) SUND-STRAND mod. 8 auto., (8) LO-SWING & FEDERAL, (4) FAY auto. 8", 12".

DRILL PRESSES: (8) LELAND-GIFFORD, 4 spdl, 1943-1944, #2-LMS, (2)—FOOTE-BURT 3 spdl., (3) GOVRO NELSON multiple, (3) BARNES camelback mult., (1) P&W #18 deep hold har. 2 spdl., mfd. in 1948.

BROACHES: (12)—OILGEAR & PORTER horiz. mod. XL20, 6M20, 5M16, mfd. 1945-1947.

PROD. MILLS: (35)—KENT-OWENS & NICHOLS models 2-20, 1-14, 1M, 2RV and #2, 1941 to 1952.

LAPPERS: NORTON #26 hydrolap 1943, Escallo center lapper lathe.

RADIAL DRILLS: FOSDICK "Economax" and CINN.-GILBERT, late type, 4'-11", mfd. 1943.

TESTING LAB: TINIUS-OLESON 120,000 lb. tensile, BAUSCH & LOMB spectrograph, spectrophot aux. eqpt., Hoskins furnace, centrifuge, etc.

MISC. MCH. TOOLS: WOHLFAHRT D.E. Borers and reamer (1947), PORTER D.E. bearing finisher (1947), LEES-BRADNER 40A tapper, GROVO NELSON multiple drills, FISHER #1 oil groovers (1943), American Shapers, chamfering mchs., 2 and 4 spdl., (2) GROB metal saws (1952), (3) 6-spdl. BABBITT spinners, pattern shop, and many other items.

PLATING DEPT.: UDYLITE cont. auto. unit 6-rectifiers, 1952 installation, Wagner & Udylite rectifiers, (20) KOROSEAL, stainless and steel tanks, buss bar, tumblers, etc.

FOUNDRY: Brass, Babbitt and iron foundry eqpt., U.S. and Hausfeld furnaces, spinners, Blystone mixer, (9) Industrial furnaces, 4800-6000 lbs., (3) Pangborn rato-blasts, 6 spdl. Babbitt mchs., Osborn moulders, Taber wheel saws, etc.

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Qu.	H.P.	Make	Type	Volts	RPM
1	3000	Whas.	Tandem	554	600
1	2200	G.E.	MCP	400	400/500
2	1500	Whas.	Rev.	400	600
1	1400	G.E.	MCP	400	63/190
1	1200	G.E.	MCP	400	750/850
1	1000	G.E.	MCP	400	350/700
1	940	Whas.	QM	350	140/170
1	800	Whas.		250	450/550
1	800	Al. Ch.		250	400/800
1	500	G.E.	CC-516	250	300/900
1	450	Whas.	MCP	250	300/900
1	350	Whas.		250	415
1	250	G.E.	MPC	250	240/900
1	300	Rel.	1970T	230	730
1	200	G.E.	CD-1650Z	230	500/1500
1	200	Whas.	CB-5112	210	400/800
1	150	G.E.		400	250/750
1	150	Cr. Wh.	6TH	230	1150
1	150	Cr. Wh.	RH-TEFC	230	600
1	150	Whas.	RK-151B	230	900/1800
1	150	Whas.	RK-291	230	340/950
1	120	G.E.	MCP	230	250/1000
1	125	Whas.	RK-161	210	500/1500
1	125	Whas.	RK-183	230	850
1	125	G.E.	MDS-416	230	415

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000/2400	G.E.	450	250/300	2300/4000
1	1750/2100	G.E.	514	250/300	2300/4000
1	3000	G.E.	500	250g	660
1	3000	G.E.	514		4000/13000
1	2000	G.E.	450	400	2300/4000
1	1500	G.E.	720	600	6000/13000
1	1500	C.W.	514	30/115	4000/13000
2	1000	G.E.	720	600	2300/4000
2	750	G.E.	720	275	2300/4000
1	750	C.W.	514	30/115	2300
1	600	G.E.	720	250	440/2300

Qu.	KVA	Make	Type	Ph.	Voltages
2	4200	G.E.	POW-T	3	13500x115/200
1	3000	Wagner	HPW-30	3	25400x2400
2	3000	G.E.	HVTDJ	1	6600x13800
2	1000	G.E.	HVTDJ	1	2400x480
2	1000	Wagner	OISC	1	13200x1400
2	667	G.E.	HD	1	13800x2500

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6	1500	Whas.	MIII	525	600
1	1250	G.E.	MCP	400	350/700
4	800	Whas.	Encl.	525	600
4	700	Whas.	MIII	250	300/700
2	600	Al. Ch.		200	600
2	500	Whas.	MIII	250	285/710
2	450/250	Al. Ch.	MIII	375/250	250/1000
1	350	G.E.	CD-160-A	230	1150
1	200/250	El. Dy.	Bize 922	230	400/1200
1	180	G.E.	MPC	250	400
1	160/90	G.E.	MPC	250	1125/625
1	150	Whas.	RK-291	230	300/900
2	125	Whas.	RK-194	230	575/950
1	125	Whas.	RK-190	550	600
1	135	G.E.	MPC	230	400/600
4	100	El. Dy.	R-36	230	450/1350
1	50	Whas.	RK-121.5	230	600/2300
1	40	G.E.	CD-123	230	500/1000
1	40	Rel.	661-T	230	250/1000
1	35	Whas.	RK	230	250/1000
2	32 1/2	Whas.	RK-150	230	400/1200
2	25	G.E.	RK-98	230	1400
1	15	G.E.	CD-85	230	575/2300
2	15	Whas.	RK-103	230	400/1600
2	10	Whas.	RK-91	230	250/1000
2	5 7/8	Rel.	T.E.F.C.	230	337/1350

TRANSFORMERS

Qu.	KVA	Make	Phase	Voltage
2	1000	Al. Ch.	1	22,000/29,700-2300/4000
3	400	Whas.	1	22,000-2300/4000
3	325	G.E.	1	12,000/11,800-2300/4000
1	200	G.E.	3	12,000/6000-240/480
1	300	Whas.	3	11,500-400
2	150	G.E.	3	2400/4160-240/480
2	100	G.E.	1	22,000/29,700-2300
2	100	G.E.	1	4160-120/340

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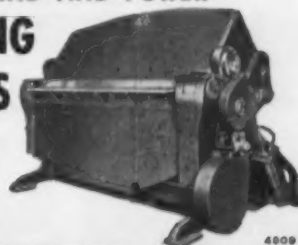


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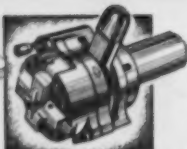
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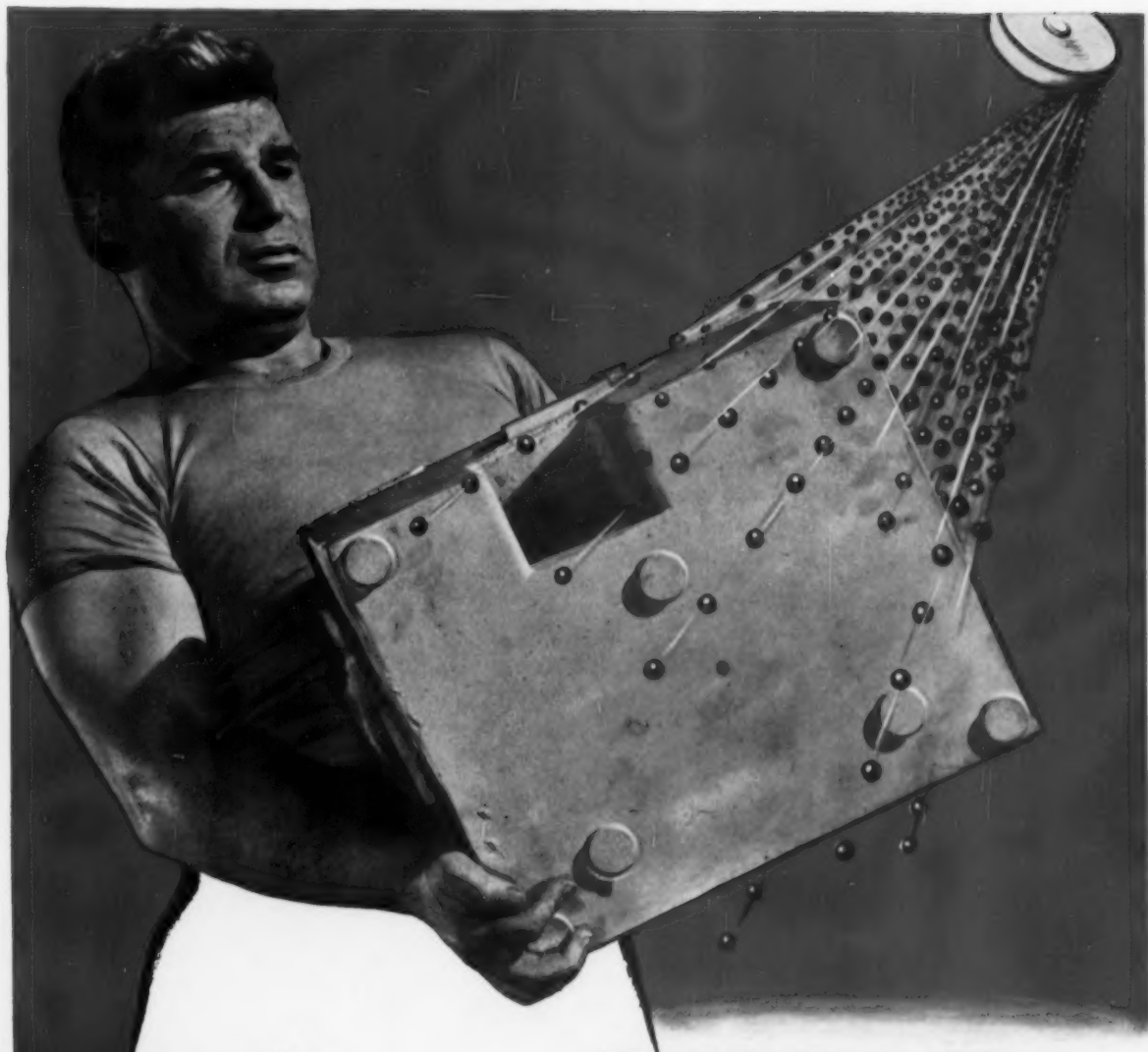
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